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ABSTRACT

Angler effort and harvest were estimated for selected Juneau roadside sport fisheries during 1990. Surveys were initiated on 7 May and continued through 4 November, although most sites were surveyed for only a portion of this time period. The contributions of hatchery chinook salmon *Oncorhynchus tshawytscha* and coho salmon *Oncorhynchus kisutch* to the fisheries by coded-wire tag lot were also estimated.

Angler effort at the sites surveyed peaked during July and August and declined greatly in early October. An estimated 47,731 (standard error = 1,579) angler-hours of effort were expended at the sites surveyed, with 76% of effort occurring in salt water. About 69% of the anglers reported targeting on salmon other than chinook salmon.

A total of 220 (SE = 54) large chinook salmon at least 28 inches (71 cm) in length and 124 (SE = 47) small chinook salmon (<28 inches in length) was harvested at the roadside sites surveyed. A total of 282 hatchery chinook salmon was taken at Fish Creek, Auke Creek mouth, and Auke Bay Floats, but no coded-wire tagged chinook salmon were sampled at other locations where chinook salmon were harvested.

Strong returns of jack coho salmon (<16 inches or 41 cm in total length) to hatchery release sites led to substantial harvests by roadside anglers. About 77% of the total of 7,208 (SE = 1,560) jack coho salmon harvested were taken at the Gastineau Hatchery, and an additional 18% were taken in Fish Creek. Wild stocks produced most large coho salmon (at least 16 inches in length), as 72% of the total harvest of 1,334 (SE = 242) large coho salmon occurred at Cowee, Peterson, and Montana creeks. Some straying of hatchery stocks of coho salmon was documented from coded-wire tag recoveries.

An estimated 11,925 (SE = 1,375) pink salmon *Oncorhynchus gorbuscha* and 3,602 (SE = 745) chum salmon *Oncorhynchus keta* were also harvested at the sites surveyed. About 58% of pink salmon and 97% of chum salmon were harvested near hatchery release sites in Gastineau Channel. Dolly Varden *Salvelinus malma* harvests totaled 3,103 (SE = 425), and cutthroat trout *Oncorhynchus clarki* harvests totaled 295 (SE = 72). Two tagged and one marked Dolly Varden were recovered during sampling of the harvest. About 31% of Dolly Varden sampled from saltwater harvests were >16 inches (41 cm) in total length.

KEY WORDS: Creel survey, angler effort and harvest, sport fishery, hatchery, enhancement, coded-wire tag, chinook salmon, *Oncorhynchus tshawytscha*, coho salmon, *Oncorhynchus kisutch*, pink salmon *Oncorhynchus gorbuscha*, chum salmon *Oncorhynchus keta*, Dolly Varden *Salvelinus malma*, cutthroat trout *Oncorhynchus clarki*, Juneau, Southeast Alaska.

## INTRODUCTION

The marine and fresh waters of Southeast Alaska support important commercial, sport, and subsistence fisheries for a variety of salmonid, bottomfish, and shellfish species. Boat sport fisheries in salt water for chinook *Oncorhynchus tshawytscha* and coho salmon *O. kisutch* are the largest and most important sport fisheries in the region; however, freshwater and saltwater fisheries accessed from the roadside are also significant. In 1989, about 4,585 angler days of freshwater sport fishing effort occurred on the Juneau roadside (Mills 1990), even though only a tiny fraction of the total freshwater fishing opportunities in Southeast Alaska occurs in this area. Additionally, about 34% (20,926 angler days) of the total saltwater shoreline effort expended in Southeast Alaska (61,068 angler days) occurred on the Juneau roadside.

Chinook and coho salmon enhancement efforts on the Juneau roadside during the past few years have been extensive (Tables 1 and 2). The hatchery release sites used are distributed along the Juneau roadside (Figure 1). Evaluations of angler effort and success at enhancement sites are necessary to determine the success of hatchery releases in improving local roadside fisheries for chinook and coho salmon. Besides returning to the terminal harvest areas, some of these fish are also harvested in the Juneau marine boat sport fishery. Once the sport fishery contributions from different releases are known, resources may be directed to developing those brood stocks, imprinting and rearing strategies, and release sites that are most cost-effective in enhancing sport fisheries. In addition to the chinook and coho salmon releases, hatchery pink and chum salmon have also been released in Gastineau Channel, generating substantial sport fisheries.

The development of these enhancement fisheries will probably have at least some effect on existing roadside fisheries. Fisheries for wild stocks of salmon, Dolly Varden, and cutthroat trout on the Juneau roadside are also important. In order to better study current patterns of angler activity and harvests, important, easily accessible roadside fisheries targeted on both wild and hatchery stocks of fish were surveyed. The last comprehensive creel survey of the Juneau roadside fisheries was done in 1987 (Bingham et al. 1988), although some of the enhancement sites were surveyed in both 1988 (Suchanek and Bingham 1989) and 1989 (Suchanek and Bingham 1990a). This report presents harvest estimates for selected roadside sport fisheries and also evaluates selected releases of hatchery fish on the Juneau roadside as to their effectiveness in contributing to both marine and roadside sport fisheries in the local area.

To provide for additional harvest of returning hatchery chinook salmon, Juneau roadside streams were opened to the harvest of chinook salmon by emergency order from 1 June to 30 September 1990. A terminal harvest area in salt water was also opened to the taking of small (<28 inches or 71 cm in total length) chinook salmon from 1 June through 30 September (Figure 1). The terminal area encompassed Gastineau Channel north and west of a line at the latitude of Dupont dock, and Fritz Cove and Auke Bay east of a line from False Outer Point to Indian Point. This area was opened to provide for harvest of mature small chinook salmon by both shoreline and boat anglers. The bag and possession limit for chinook salmon in Juneau roadside streams and the terminal harvest area was 2 large (at least 28 inches in total length) fish and 2 small fish. Outside the terminal area, the minimum size limit for chinook salmon was 28 inches and the bag limit was 2 fish.

Table 1. Summary of hatchery reared chinook salmon smolts released in the Juneau sport fishery enhancement program, 1986-1990. All of the releases have been reared at the Snettisham or Gastineau hatcheries. This table does not include a 1990 release of chinook salmon smolts into Twin Lakes. Not all of the fish released from a given tag lot are tagged.

| Site | Release strategy[a] | 1986 #(tag lot) | 1987 #(tag lot) | 1988 #(tag lot) | 1989 #(tag lot) | 1990 #(tag lot) |
|---|---|---|---|---|---|---|
| Montana Creek | DIR | 28,335 (4-26-2) | 30,703 (4-27-45) | 52,000 (4-26-12) | 10,000 (4-31-34) | 0 |
| | | | | | 23,000 (4-31-58) | 0 |
| Fish Creek | DIR | 30,620 (4-26-5) | 31,479 (4-27-42) | 0 | 0 | 0 |
| | IMP | 29,652 (4-26-7) | 31,205 (4-27-44) | 74,000 (4-30-01) | 67,000 (4-31-60) | 99,697 (4-33-60) |
| | IMP | | | | | 49,775 (4-33-43) |
| Auke Creek mouth | DIR | 26,896 (4-26-8) | 50,522 (4-27-43) | 0 | 0 | 0 |
| | RET | 29,003 (4-26-1) | 15,038 (4-27-50) | 46,000 (4-29-62) | 0 | 0 |
| | IMP | 29,737 (4-26-3) | 24,972 (4-27-46) | 46,000 (4-29-61) | 117,000 (4-32-01) | 144,609 (4-34-15) |
| | IMP | | | | | 30,732 (4-33-41) |
| Sheep Creek mouth | IMP | 30,280 (4-26-6) | 31,112 (4-27-48) | 31,556 (4-30-02) | 43,000 (4-31-61) | 101,847 (4-34-10) |
| | IMP | | | | 77,000 (4-31-62) | 20,308 (4-33-42) |
| Gastineau Hatchery | IMP | 0 | 0 | 0 | 11,000 (4-31-36) | 32,481 (4-33-44) |
| | | | | | | 68,981 (4-33-56) |
| Totals | | 204,523 | 215,031 | 249,556 | 348,000 | 548,430 |

[a] DIR = Direct release; RET = Retained and fed; IMP = Retained, fed, and imprinted.

Table 2. Summary of hatchery reared coho salmon smolts released in the Juneau sport fishery enhancement program, 1986-1990. All of the releases have been reared at the Snettisham or Douglas Island Pink and Chum (DIPAC) hatcheries. This table does not include releases of coho salmon into Twin Lakes. Not all of the fish released from a given tag lot are tagged.

| Site | Release Strategy[a] | 1986 #(tag lot) | 1987 #(tag lot) | 1988 #(tag lot) | 1989 #(tag lot) | 1990 #(tag lot) |
|---|---|---|---|---|---|---|
| Salmon Creek | IMP | 20,422 (4-23-61) | 101,000 (4-27-28) | 0 | 0 | 0 |
| Fish Creek | IMP | 0 | 53,000 (4-27-29) | 50,000 (4-29-48) | 42,000 (4-31-53) | 20,376 (4-32-35) |
| | IMP | | | | | 20,860 (4-29-53)[b] |
| | IMP | | | | | 6,420 (4-31-46)[b] |
| Sheep Creek | RET | 0 | 39,442 (4-28-20) | 100,000 (4-29-47) | 44,940 (4-31-54) | 182,006 (4-34-19)[c] |
| | RET | | | | | 175,936 (4-34-22)[c] |
| | RET | | | | | 175,270 (4-34-23)[c] |
| Mendenhall Ponds | DIR | 0 | 53,000 (4-27-30) | 50,000 (4-29-49) | 37,000 (4-31-55) | 25,843 (4-32-37) |
| | | | | | | 100,763 (4-32-36)[d] |
| Gastineau Hatchery | IMP | 0 | 0 | 49,659 (4-30-15)[c] | 37,000 (4-32-31)[c] | 182,874 (4-34-20)[c] |
| | IMP | | | | | 184,391 (4-34-21)[c] |
| | IMP | | | | | 179,001 (4-34-24)[c] |
| Auke Recreational Area | IMP | 0 | 0 | 18,896 (4-30-14)[c] | 0 | 0 |
| Totals | | 20,422 | 246,442 | 268,555 | 160,940 | 1,253,740 |

[a] DIR = Direct release RET = Retained and fed IMP = Retained, fed, and imprinted

[b] Pavlof early run stock

[c] Reared by DIPAC

[d] Fry release by DIPAC on 18 December 1989.

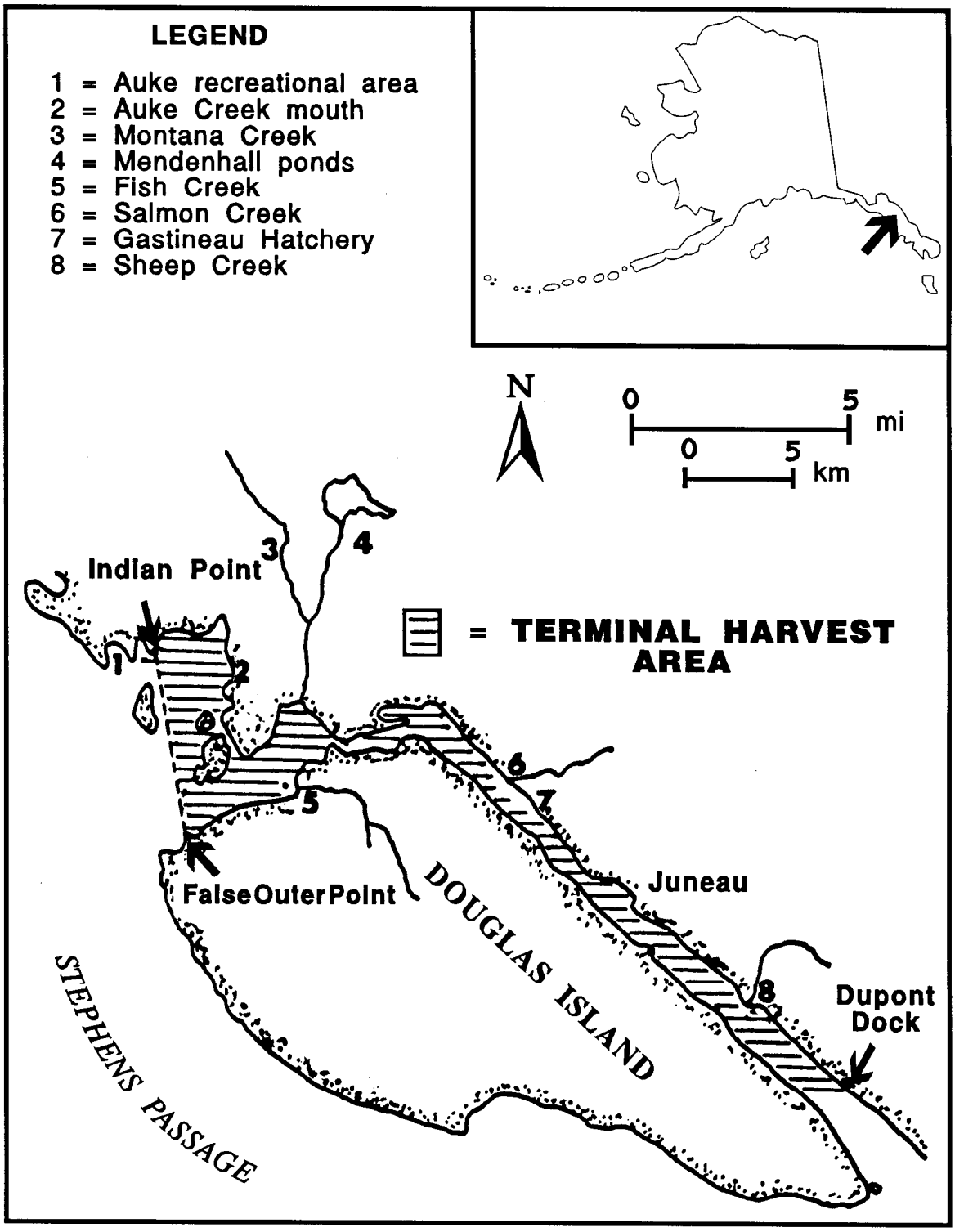


Figure 1. Hatchery release sites for chinook and coho salmon on the Juneau roadside 1986-1990 and terminal harvest area opened to increased bag limits for chinook salmon during 1989 and 1990.

The bag limit for coho salmon 16 inches (41 cm) or more in length in saltwater areas was 6 fish per day and 12 in possession, while freshwater anglers were limited to 2 fish per day and in possession. An additional 10 coho salmon less than 16 inches in length could be taken in both fresh and saltwater. Bag limits for pink and chum salmon totaled 6 of each species per day and 12 in possession. Only two Dolly Varden per day and in possession could be taken in freshwater, but in saltwater the bag and possession limit was 10. The bag limit for cutthroat trout was 5 per day and 10 in possession, but only 1 daily and 2 in possession could be over 16 inches in length.

The specific objectives for the 1990 Juneau roadside harvest surveys were:

1. To estimate the total angler effort and harvest of hatchery produced chinook salmon by coded-wire tag lot in terminal harvest areas at the mouths of Auke and Sheep creeks and in Montana and Fish creeks from 18 June to 9 September 1990.

2. To estimate the total angler effort and harvest of hatchery produced coho salmon by coded-wire tag lot in terminal harvest areas at Sheep Creek, Fish Creek, Gastineau Hatchery, and Mendenhall Ponds from 10 September to 4 November 1990.

3. To estimate the total angler effort and harvest of Dolly Varden, pink salmon, and coho salmon for the fisheries and time periods listed in Table 3. These sites were chosen to give an overview of major known fisheries readily accessible from the roadside. The sites were pooled into the groups presented in Table 3 to aid in discussion of these fisheries.

4. To estimate the proportion of Dolly Varden harvested in the following groups: less than 12 inches (300 mm fork length), 12 to 14 inches (301-350 mm fork length), 14 to 16 inches (351-400 mm fork length), and more than 16 inches (400 mm fork length) in total length for the pooled saltwater sites and the pooled freshwater sites.

## METHODS

### Study Design

A roving type of creel survey (Neuhold and Lu 1957) was used to estimate angler effort and harvest for the Juneau roadside fisheries. The study areas surveyed were distributed along the entire Juneau roadside (Figure 2). Sampling effort at the sites was limited to periods during which some fishing effort was expected to occur at the sites (Table 3). Site descriptions for each of the locations surveyed can be found in Appendix A1.

The creel survey season extended from 7 May through 4 November 1990. The season was divided into biweekly periods which began on Mondays and ended on Sundays. Within each biweekly period, all days were classified as either weekdays or weekend/holidays (all Saturdays, Sundays, and the dates of 28 May, 4 July, 3 September, and 8 October). Sampling was split approximately 50% to weekdays and 50% to weekend/holidays to approximate the relative amount of angling effort

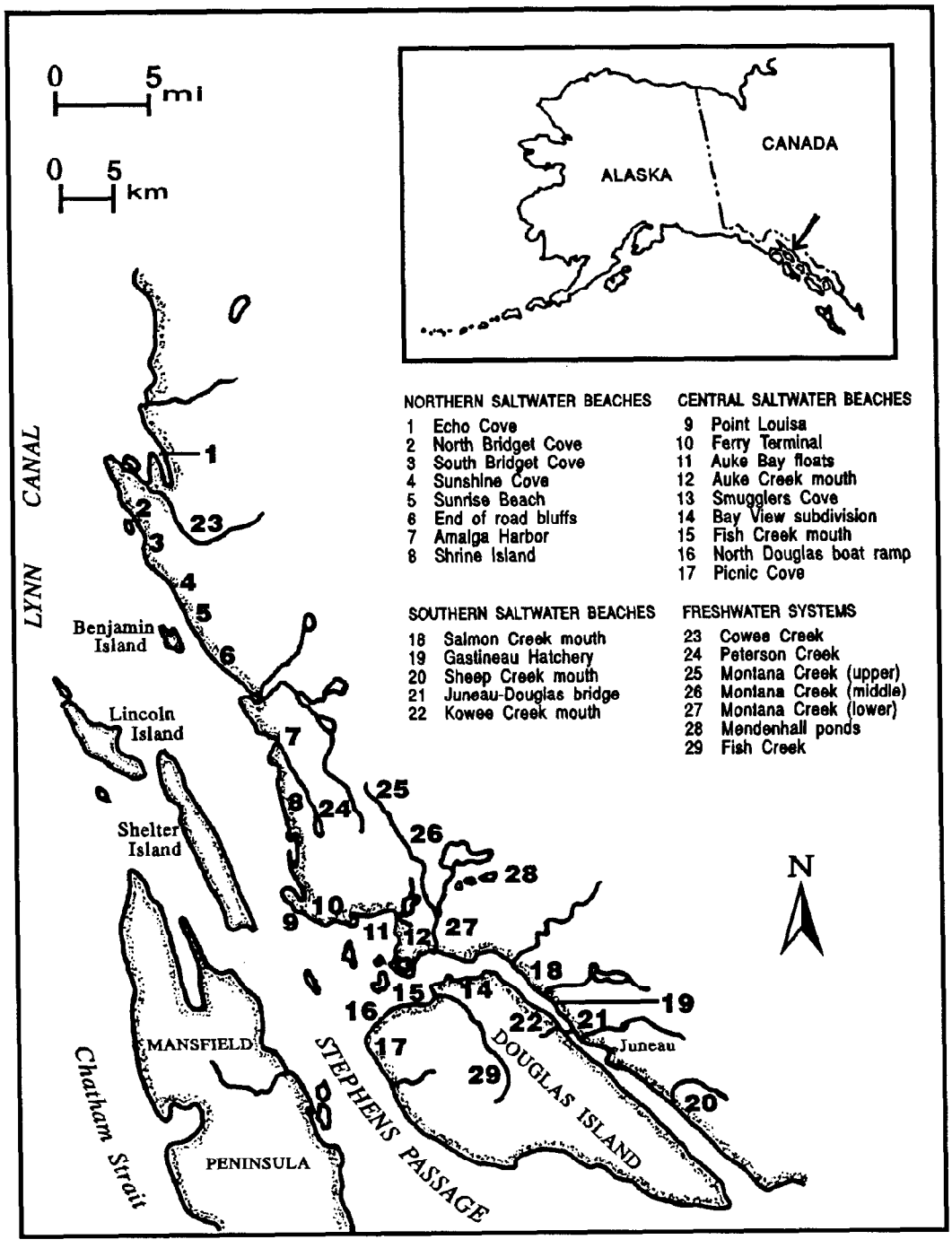


Figure 2. Sport fishing sites along the Juneau road system sampled during 1990.

Table 3. Summary of Juneau roadside fisheries surveyed by biweekly period during 1990.

| | Biweekly Period | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5/07-5/20 | 5/21-6/03 | 6/04-6/17 | 6/18-7/01 | 7/02-7/15 | 7/16-7/29 | 7/30-8/12 | 8/13-8/26 | 8/27-9/09 | 9/10-9/23 | 9/24-10/07 | 10/08-10/21 | 10/22-11/04 |
| Northern saltwater beaches (Lynn Canal area): | | | | | | | | | | | | | |
| Echo Cove | XX | XX | XX | XX | XX | XX | | | | | | | |
| North Bridget Cove | XX | XX | XX | XX | XX | XX | | | | | | | |
| South Bridget Cove | XX | XX | XX | XX | XX | XX | | | | | | | |
| Sunshine Cove | XX | XX | XX | XX | XX | XX | | | | | | | |
| Sunrise Beach | XX | XX | XX | XX | XX | XX | | | | | | | |
| End of road bluffs | XX | XX | XX | XX | XX | XX | | | | | | | |
| Amalga Harbor | | | XX | XX | XX | XX | XX | XX | XX | XX | XX | | |
| Shrine Island | XX | XX | XX | XX | XX | XX | XX | XX | XX | XX | | | |
| Central saltwater beaches (Auke Bay and Fritz Cove area): | | | | | | | | | | | | | |
| Point Louisa | XX | XX | XX | XX | XX | XX | XX | XX | XX | XX | | | |
| Ferry Terminal | XX | XX | XX | | | | | | | | | | |
| Auke Bay floats | | XX | XX | XX | XX | XX | XX | XX | XX | | | | |
| Auke Creek mouth | | | | XX | XX | XX | XX | XX | XX | XX | XX | | |
| Smugglers Cove | XX | XX | XX | | | | | | | | | | |
| Bay View subdivision | XX | XX | XX | | | | | | | | | | |
| Fish Creek mouth | XX | XX | XX | XX | XX | XX | | | | | | | |
| North Douglas boat ramp | XX | XX | XX | XX | XX | XX | XX | XX | XX | | | | |
| Picnic Cove | XX | XX | XX | XX | XX | XX | XX | XX | XX | XX | | | |
| Southern saltwater beaches (Gastineau Channel area): | | | | | | | | | | | | | |
| Salmon Creek mouth | | | | XX | XX | XX | XX | XX | XX | | | | |
| Gastineau Hatchery | XX | XX | XX | XX | XX | XX | XX | XX | XX | XX | XX | XX | XX |
| Sheep Creek mouth | XX | XX | XX | XX | XX | XX | XX | XX | XX | XX | XX | XX | XX |
| Juneau-Douglas bridge | XX | XX | XX | XX | XX | XX | XX | XX | XX | | | | |
| Kowee Creek mouth | XX | XX | XX | XX | XX | XX | XX | XX | XX | | | | |
| Freshwater systems: | | | | | | | | | | | | | |
| Cowee Creek | XX | XX | XX | XX | XX | XX | XX | XX | XX | XX | XX | XX | |
| Peterson Creek[a] | | | | XX | XX | XX | XX | XX | XX | XX | XX | | |
| Montana Creek (upper) | | | | | | | XX | XX | XX | XX | XX | XX | |
| Montana Creek (middle) | | | | | | | XX | XX | XX | XX | XX | XX | |
| Montana Creek (lower) | XX | XX | XX | XX | XX | XX | XX | XX | XX | XX | XX | XX | |
| Mendenhall ponds | | | | | | | | | | XX | XX | XX | XX |
| Fish Creek | | | | XX | XX | XX | XX | XX | XX | XX | XX | XX | XX |

[a] This area was surveyed as part of the Peterson Creek steelhead project through 5 June.

occurring at these times. Some switching of selected weekdays sampled was done to assure two consecutive days off for staff every week.

The sampling day began at 0600 hours or at 1 hour after the beginning of civil twilight, whichever was later. The sampling day ended at the end of civil twilight or at 2300 hours, whichever was earlier. Length of the sampling day was rounded to the nearest half-hour. The length of the fishing day was constant within a biweekly time period.

The sites were sampled twice on each day selected for sampling during a morning and afternoon sampling period. During a given sampling period, the sampler visited all sites as a route. The starting location for each day was chosen randomly, and then the remainder of the route was fixed in such a way that mileage was minimized. Both routes in a given day used the same starting point and sampling circuit. The starting time was usually the beginning of the sampling period, but if the anticipated duration of the surveys was less than the time allotted in the schedule then starting times for the surveys were randomly selected by the creel technician after they estimated survey duration. On some days, only one circuit of the sites sampled was made due to various scheduling problems.

Data Collection

Individual anglers were asked the number of hours fished, whether the trip was complete or incomplete, and the number of each fish species that were taken and released. Chinook salmon less than 28 inches (71 cm) in total length were categorized as small chinook salmon. Chinook salmon at least 28 inches in length were categorized as large chinook salmon. Similarly, coho salmon less than 16 inches (41 cm) in total length were called jack coho salmon, while those 16 inches and greater in length were called large coho salmon. The target for each angler was also recorded as either: chinook salmon, salmon other than chinook, Dolly Varden, cutthroat trout, or bottomfish (Pacific halibut, other flatfish, etc). Since so few anglers reported targeting on cutthroat trout and many anglers said they were fishing for "trout" but catching Dolly Varden, the Dolly Varden target was recorded when anglers were fishing for small salmonids.

An instantaneous count of the number of anglers fishing in an area was also recorded. For each sample, counts were conducted either before or after interviews as determined on a random basis. Harvested chinook and coho salmon were also inspected for missing adipose fins. Harvested Dolly Varden were inspected for floy tags and caudal fin clips. Fork lengths were taken from harvested Dolly Varden as time allowed.

Harvest Estimate Data Analysis

Angler counts were considered instantaneous and reflect fishing effort at the time of the count. Effort was estimated by multiplying the average count by the fishery hours available in the time periods associated with the counts to obtain effort in angler-hours. The catch per unit effort (CPUE) and harvest per unit effort (HPUE) for each species of fish was estimated from angler interview data. The estimated catch and harvest was obtained from the product of the effort and the CPUE and HPUE estimates.

The jackknife estimation approach was used to obtain the CPUE and HPUE estimates. This approach was used since most other estimators are known to be biased (for

use as ratio estimators), and the jackknife estimator has been shown to be less biased and procedures exist for correcting some of this bias (see Cochran 1977, section 6.15, pages 174-177; and Smith 1980).

Prior to applying the jackknife procedure each angler's catch and harvest was weighted by the relative numbers of anglers utilizing each fishery during each period (as measured by the angler count). This weighting procedure ensured that each sample period's information was proportional to the angler effort at the time of the sample.

Both completed-trip and uncompleted-trip angler interviews were collected. An evaluation of the hypothesis of no difference in catch or harvest rates by type of trip angler was to have been conducted. Unfortunately too few completed-trip anglers were interviewed to conduct the tests. Accordingly, all analyses were conducted using both trip types.

Estimates of catch, harvest, and angler effort using the angler counts and angler interviews were obtained by first estimating the mean daily angler count:

$$\bar{x}_{hi} = \frac{\sum_{q=1}^{r_{hi}} x_{hiq}}{r_{hi}} \tag{1}$$

where $x_{iq}$ is equal to the number of anglers counted fishing during count $q$ for day $i$ within stratum $h$, and $r_{hi}$ is the number of angler counts conducted within each sampled day.

Next the mean angler count for the stratum was obtained:

$$\bar{\bar{x}}_h = \frac{\sum_{i=1}^{d_{xh}} \bar{x}_{hi}}{d_{xh}} \tag{2}$$

where $d_{xh}$ is equal to the number of days sampled for angler counts.

This mean of mean angler count was then expanded by the total number of hours available for sampling to obtain the angler effort (in angler-hours) estimate for each stratum:

$$\hat{E}_h = D_h H_h \bar{\bar{x}}_h \; ; \tag{3}$$

where $D_h$ is the number of days in stratum $h$ and $H_h$ is equal to the number of hours within each day within each stratum.

The variance of the estimated angler effort for each stratum within each fishery was obtained by noting that the first two terms of equation (3) are constants, and as such, the variance was obtained as follows (see Kish 1965, page 60, equation 2.8.5):

$$\hat{V}_h[\hat{E}_h] = (D_h H_h)^2 \hat{V}_h[\bar{\bar{x}}_h] \tag{4}$$

where $\hat{V}_h[\bar{\bar{x}}_h]$ is the estimated variance of the mean of mean angler count for each stratum, obtained by the two-stage variance equation (following the approach outlined by Cochran 1977):

$$\hat{V}_h[\bar{\bar{x}}_h] = (1 - f_{x1h})\frac{s^2_{x1h}}{d_{xh}} + \frac{f_{x1h}}{d^2_{xh}}\sum_{i=1}^{d_{xh}}\left\{\frac{s^2_{x2hi}}{r_{hi}}\right\} \quad (5)$$

$f_{x1h}$ equals the first stage sampling fraction (= $d_{xh}$ / $D_h$); $s^2_{x1h}$ is the among day variance for the mean angler count estimate for each stratum:

$$s^2_{x1h} = \frac{\sum_{i=1}^{d_{xh}}(\bar{x}_{hi} - \bar{\bar{x}}_h)^2}{d_{xh} - 1} \quad (6)$$

and $s^2_{x2hi}$ is the within day variance for the mean angler count estimate for each day:

$$s^2_{x2hi} = \frac{\sum_{q=1}^{r_{hi}}(x_{hiq} - \bar{x}_{hi})^2}{r_{hi} - 1} \quad (7)$$

The next steps involved obtaining estimates of CPUE (and HPUE), and as such, the catches were weighted as noted above:

$$c'_{hijo} = \frac{x_{hiq}}{\bar{x}_{hi}} c_{hijo} \quad (8)$$

where $c_{hijo}$ is the unweighted catch of each interviewed angler and the other terms are as defined above.

Then using the weighted catches, the jackknife sample estimate of mean weighted CPUE was obtained as follows:

$$CPUE'^{*}_{hijk} = \frac{\sum_{\substack{o=1 \\ o\neq k}}^{m_{hij}} c'_{hijo}}{\sum_{\substack{o=1 \\ o\neq k}}^{m_{hij}} e_{hijo}} \quad (9)$$

where $m_{hij}$ is the number of anglers interviewed during each sample and $e_{hijo}$ is the effort of each interviewed angler.

The jackknife mean weighted CPUE for each sample on each sampled day was then obtained by:

$$\overline{CPUE}'^{*}_{hij} = \frac{\sum_{k=1}^{m_{hij}} CPUE'^{*}_{hijk}}{m_{hij}} \quad (10)$$

Then the bias correction was performed[1]:

$$\overline{CPUE}'^{*\dagger}_{hij} = \left[m_{hij}\left(\overline{CPUE}'_{hij} - \overline{CPUE}'^{*}_{hij}\right)\right] + \overline{CPUE}'^{*}_{hij} \tag{11}$$

where

$$\overline{CPUE}'_{hij} = \frac{\sum_{o=1}^{m_{hij}} c'_{hijo}}{\sum_{o=1}^{m_{hij}} e_{hijo}} \tag{12}$$

The bias-corrected weighted jackknife mean was then averaged over all periods sampled within each day:

$$\overline{\overline{CPUE}}'^{*\dagger}_{hi} = \frac{\sum_{j=1}^{p_{hi}} \overline{CPUE}'^{*\dagger}_{hij}}{p_{hi}} \tag{13}$$

where $p_{hi}$ equals the number of periods sampled for angler interviews within each sampled day (in general equal to two samples for this survey).

Then the stratum mean CPUE was obtained by averaging over all days sampled:

$$\overline{\overline{\overline{CPUE}}}'^{*\dagger}_{h} = \frac{\sum_{i=1}^{d_{ch}} \overline{\overline{CPUE}}'^{*\dagger}_{hi}}{d_{ch}} \tag{14}$$

where $d_{ch}$ equals the number of days sampled for angler interviews for each stratum in each fishery.

This estimated mean CPUE for the stratum was then used to estimate the catch for the stratum by expansion:

$$\hat{C}_h = \hat{E}_h \overline{\overline{\overline{CPUE}}}'^{*\dagger}_{h} \tag{15}$$

The harvest for each stratum was estimated similarly by substituting the appropriate harvest statistics into equations (8) through (15) above.

The variance of the estimated catch for each stratum was obtained by the formula for the variance of a product of independent random variates (Goodman 1960):

$$\hat{V}_h\left[\hat{C}_h\right] = \hat{E}_h^2 \hat{V}_h\left[\overline{\overline{\overline{CPUE}}}'^{*\dagger}_{h}\right] + \left[\overline{\overline{\overline{CPUE}}}'^{*\dagger}_{h}\right]^2 \hat{V}_h\left[\hat{E}_h\right] + \hat{V}_h\left[\overline{\overline{\overline{CPUE}}}'^{*\dagger}_{h}\right]\hat{V}_h\left[\hat{E}_h\right] \tag{16}$$

where $\hat{V}_h\left[\overline{\overline{\overline{CPUE}}}'^{*\dagger}_{h}\right]$ is the estimated variance of the estimated mean bias-corrected weighted jackknife CPUE for each stratum at each fishery obtained by the usual

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[1] If the bias correction resulted in a value that was less than zero, then the uncorrected value was used in further calculations.

three-stage variance equation (following the approach outlined by Cochran 1977, see equation 10.36, page 287):

$$\hat{V}_h\left[\overline{\overline{\overline{CPUE}}}_h'^{*\dagger}\right] = (1 - f_{c1h})\frac{s_{c1h}^2}{d_{ch}} + \frac{f_{c1h}}{d_{ch}^2}\sum_{i=1}^{d_{ch}}\left\{(1 - f_{c2hi})\frac{s_{c2hi}^2}{p_{hi}}\right\} + \frac{f_{c1h}}{d_{ch}^2}\sum_{i=1}^{d_{ch}}\left\{\frac{f_{c2hi}}{p_{hi}^2}\sum_{j=1}^{p_{hi}} s_{c3hij}^{2'*}\right\} \quad (17)$$

$f_{c1h}$ equals the first stage sampling fraction (= $d_{ch}$ / $D_h$), $f_{c2hi}$ is the second stage sampling fraction (= $p_{hi}$ / $P_{hi}$), $P_{hi}$ equals the number of sample periods that could be sampled each day at each fishery (which is set equal to the next largest whole integer of the result from dividing the number of hours in the sampling day by two; i.e., the number of systematic samples conducted)[2],

$s_{c1h}^2$ is the among day variance for the mean CPUE estimate:

$$= \frac{\sum_{i=1}^{d_{ch}}\left(\overline{\overline{\overline{CPUE}}}_{hi}'^{*\dagger} - \overline{\overline{\overline{CPUE}}}_h'^{*\dagger}\right)^2}{d_{ch} - 1} \quad (18)$$

$s_{c2hi}^2$ is the among day variance for the mean CPUE estimate for each day:

$$= \frac{\sum_{j=1}^{p_{hi}}\left(\overline{CPUE}_{hij}'^{*\dagger} - \overline{\overline{\overline{CPUE}}}_{hi}'^{*\dagger}\right)^2}{p_{hi} - 1} \quad (19)$$

and $s_{c3hij}^{2'*}$ is the among angler variance for the weighted jackknifed sample mean CPUE estimate for each sample (adapted from Efron 1982, equation 3.2, page 13)[note that bias-corrected values for CPUE are <u>not</u> used in this calculation, as bias-corrected CPUE's are not estimable for individual anglers]:

$$s_{c3hij}^{2'*} = \frac{m_{hij} - 1}{m_{hij}}\sum_{k=1}^{m_{hij}}\left(CPUE_{hijk}'^{*} - \overline{CPUE}_{hij}'^{*}\right)^2 \quad (20)$$

Variance estimates for the estimated harvest were obtained by replacing the appropriate harvest statistics (h's and H's) for the catch statistics (c's and C's) in equations (16) through (20) above.

Since the estimates of angler effort, catch, and harvest are estimates of totals, then standard errors (SE's) were obtained by taking square roots of the associated variances. Totals across strata were obtained by summing the corresponding point and variance estimates.

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2 For example if the sampling day is 17 hours long then the number of systematic samples that could have been selected was 9.

The assumptions necessary for unbiased point and variance estimates obtained by the procedures outlined above include:

1. no significant fishing effort occurred during the hours not surveyed;

2. catch and harvest rates were independent of the duration of fishing trip (as per DiCostanzo 1956);

3. the number of anglers fishing does not change during the course of one sample at one site[3];

4. the angler count process was approximately instantaneous, or we assume that the creel clerk traveled substantially faster than anglers move about the fishery, or exit, or enter[4];

5. anglers accurately report their hours of fishing effort (for unbiased CPUE and HPUE estimates) and the species and number of all fish released (for unbiased CPUE estimates); and

6. uncompleted-trip angler catch and harvest rates are the same as completed-trip angler catch and harvest rates.

We could not assess the validity of all these assumptions. It appeared that the hours surveyed encompassed almost all fishing effort (assumption 1) as anglers almost never fished after dark or before 0600 hours. A few chinook salmon anglers did begin fishing at Picnic Cove during May prior to 0600 hours. Since the time required to sample most of the sites was short, assumptions 3 and 4 were usually met. It was not possible to evaluate assumption 5 although there was no reason for anglers to inaccurately report hours fished. There were not enough completed trip interviews to test assumption 6, but bag limits were generally not limiting except for large coho salmon at Montana and Cowee creeks.

Contributions of Coded-Wire Tagged Stocks

Chinook and coho salmon sampled that had missing adipose fins were measured to the nearest 5 mm (tip of snout to fork of tail), and their heads were retained. A locking plastic strap with a unique number was inserted through the jaw. Heads and coded-wire tag (CWT) recovery data were sent to the Alaska Department of Fish and Game CWT Processing Laboratory in Juneau for tag removal and decoding.

Heads were classified as "random" (randomly sampled during regularly scheduled creel sampling periods) or "select" (voluntarily provided by unsampled anglers). Only random recoveries were used to estimate CWT contributions.

Hatchery contributions, associated variances, and standard errors were estimated for the creel survey by procedures outlined in Suchanek and Bingham (1990a). These procedures essentially follow the approach outlined by Clark and Bernard (1987) as modified by Conrad and Larson (1987). Due to limitations in the CWT

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[3] This assumption is necessary in that only one angler count was conducted per period sampled within each sampled day, and as such the within-period variance component for the effort estimate can not be estimated. Hence, the variance estimates are negatively biased, unless this assumption is true.

[4] This assumption is especially important in terms of total estimates across fisheries.

Processing Laboratory data base structure, contributions of coho salmon were not separated into "large" and "jack" categories.

## RESULTS

A total of 246 samples were taken of the Juneau roadside fisheries from 7 May to 4 November 1990 (Appendix A2). Overall, 4,289 angler contacts were made, of which 3,549 (83%) had not yet completed their fishing trips. The computer files listed in Appendix A3 contain the raw data along with associated SAS code, data sets, log, and listing files used during analysis of the data.

Detailed tables presenting effort and harvests of the sampled roadside fisheries by area and biweekly period can be found in Appendix A for the following site groupings: northern saltwater beaches in the Lynn Canal area (Appendix A4), central saltwater beaches in the Auke Bay and Fritz Cove area (Appendix A5, southern saltwater beaches in the Gastineau Channel area (Appendix A6), and freshwater sites (Appendix A7). Only a summary of the most important effort and harvest results will be presented here.

### Angler Effort

Angler effort at the sites surveyed totaled 47,731 (SE = 1,579) angler hours (Table 4). Highest angler effort occurred in July and August, and effort decreased greatly in early October. About 76% of the surveyed effort occurred in salt water, with anglers expending 64% of the total effort at the central and southern saltwater sites. Effort at the freshwater sites increased greatly in July as salmon runs began entering these systems. Beginning in September, most angler effort occurred in fresh water as anglers target on runs of coho salmon.

Of the 4,289 angler contacts made during the course of the surveys, 69% of the anglers reported that their target was salmon other than chinook (Table 5). The percentage of anglers targeting on salmon other than chinook varied from almost none in May and early June to almost 100% in September and October. Another 21% of the anglers contacted reported that they were targeting on Dolly Varden or "trout." Most of the anglers targeting on Dolly Varden fished in May and June, as up to 78% of the anglers during this time period reported targeting on them. Chinook salmon were targeted by 8% of the anglers, although up to 47% of the anglers contacted during 7 May to 20 May were targeting on chinook salmon. Almost all of the anglers targeting on chinook salmon at this time were contacted at the Picnic Cove site. Most of the 2% of the anglers targeting on bottomfish were fishing from the Auke Bay floats.

### Chinook Salmon Fisheries

Chinook salmon were harvested in relatively small numbers at only a few locations (Table 6). No chinook salmon were reported caught at the mouth of Sheep Creek or in Montana Creek, even though these locations were release sites for hatchery chinook salmon. From a total catch of 529 chinook salmon, 220 large and 124 small chinook salmon were harvested. The largest numbers of chinook salmon were caught at Fish Creek and Auke Creek mouth. Both wild and hatchery chinook salmon were taken during the surveys.

Chinook salmon became available at Fish Creek and in the Auke Bay area in early July and were available until early September. Peak catches occurred in August,

Table 4. Angler-hours of effort for Juneau roadside sport fisheries by biweekly period during 1990.

| Biweek | Site Grouping: Northern salt water | Central salt water | Southern salt water | Fresh water | Total | SE |
|---|---|---|---|---|---|---|
| 07 May - 20 May | 520 | 2,592 | 675 | 144 | 3,931 | 439 |
| 21 May - 03 Jun | 624 | 1,276 | 416 | 64 | 2,380 | 262 |
| 04 Jun - 17 Jun | 618 | 1,179 | 247 | 93 | 2,137 | 290 |
| 18 Jun - 01 Jul | 710 | 1,953 | 568 | 485 | 3,716 | 424 |
| 02 Jul - 15 Jul | 881 | 1,756 | 2,411 | 883 | 5,931 | 584 |
| 16 Jul - 29 Jul | 859 | 1,780 | 4,921 | 1,521 | 9,081 | 816 |
| 30 Jul - 12 Aug | 501 | 1,402 | 3,024 | 2,011 | 6,938 | 676 |
| 13 Aug - 26 Aug | 604 | 1,828 | 1,220 | 1,221 | 4,873 | 434 |
| 27 Aug - 09 Sep | 200 | 1,107 | 508 | 1,216 | 3,031 | 434 |
| 10 Sep - 23 Sep | 135 | 124 | 1,040 | 1,886 | 3,185 | 277 |
| 24 Sep - 07 Oct | 0 | 0 | 561 | 1,241 | 1,802 | 183 |
| 08 Oct - 21 Oct | -- | -- | 168 | 469 | 637 | 131 |
| 22 Oct - 04 Nov | -- | -- | 10 | 79 | 89 | 51 |
| Total | 5,652 | 14,997 | 15,769 | 11,313 | 47,731 | |
| SE | 443 | 884 | 1,050 | 643 | 1,579 | |
| Percent of total effort | 12% | 31% | 33% | 24% | | |

Table 5. Number and percentage of anglers interviewed by target species for major fisheries on the Juneau roadside by biweekly period during 1990.

| Biweek | Target Species: Chinook salmon Number | Chinook salmon Percent | Other salmon Number | Other salmon Percent | Dolly Varden Number | Dolly Varden Percent | Bottomfish Number | Bottomfish Percent |
|---|---|---|---|---|---|---|---|---|
| 07 May - 20 May | 150 | 47% | 4 | 1% | 167 | 52% | 0 | 0% |
| 21 May - 03 Jun | 52 | 20% | 2 | 1% | 201 | 78% | 2 | 1% |
| 04 Jun - 17 Jun | 24 | 13% | 0 | 0% | 135 | 75% | 21 | 12% |
| 18 Jun - 01 Jul | 18 | 6% | 50 | 16% | 234 | 73% | 20 | 6% |
| 02 Jul - 15 Jul | 16 | 3% | 385 | 76% | 94 | 19% | 9 | 4% |
| 16 Jul - 29 Jul | 23 | 3% | 713 | 95% | 14 | 2% | 3 | <0.5% |
| 30 Jul - 12 Aug | 7 | 2% | 354 | 90% | 23 | 6% | 10 | 3% |
| 13 Aug - 26 Aug | 37 | 8% | 398 | 86% | 20 | 4% | 10 | 2% |
| 27 Aug - 09 Sep | 3 | 1% | 333 | 97% | 6 | 2% | 2 | 1% |
| 10 Sep - 23 Sep | 0 | 0% | 391 | 99% | 3 | 1% | 0 | 0% |
| 24 Sep - 07 Oct | 0 | 0% | 242 | 98% | 5 | 2% | 0 | 0% |
| 08 Oct - 21 Oct | 0 | 0% | 97 | 100% | 0 | 0% | 0 | 0% |
| 22 Oct - 04 Nov | 0 | 0% | 11 | 100% | 0 | 0% | 0 | 0% |
| Total | 330 | 8% | 2,980 | 69% | 902 | 21% | 77 | 2% |

Table 6. Harvest and catch of chinook salmon for major fisheries on the Juneau roadside by biweekly period during 1990.

| Biweek | Site: Fish Creek | Auke Creek mouth | Auke Bay floats | Other saltwater sites pooled | Total | SE |
|---|---|---|---|---|---|---|
| Large chinook salmon (>28") harvested | | | | | | |
| 07 May - 20 May | 0 | 0 | 0 | 46 | 46 | 23 |
| 21 May - 03 Jun | 0 | 0 | 0 | 4 | 4 | 4 |
| 04 Jun - 17 Jun | 0 | 0 | 0 | 1 | 1 | 1 |
| 18 Jun - 01 Jul | 0 | 0 | 0 | 4 | 4 | 4 |
| 02 Jul - 15 Jul | 0 | 0 | 4 | 0 | 4 | 3 |
| 16 Jul - 29 Jul | 22 | 3 | 0 | 0 | 25 | 18 |
| 30 Jul - 12 Aug | 27 | 12 | 0 | 0 | 39 | 22 |
| 13 Aug - 26 Aug | 7 | 77 | 0 | 0 | 84 | 38 |
| 27 Aug - 09 Sep | 0 | 2 | 11 | 0 | 13 | 9 |
| Total | 56 | 94 | 15 | 55 | 220 | |
| SE | 29 | 38 | 10 | 23 | 54 | |
| Percent of harvest | 25% | 43% | 7% | 25% | | |
| Small chinook salmon (<28") harvested | | | | | | |
| 07 May - 20 May | 0 | 0 | 0 | 0 | 0 | -- |
| 21 May - 03 Jun | 0 | 0 | 0 | 0 | 0 | -- |
| 04 Jun - 17 Jun | 0 | 0 | 0 | 7 | 7 | 7 |
| 18 Jun - 01 Jul | 0 | 5 | 0 | 0 | 5 | 4 |
| 02 Jul - 15 Jul | 6 | 0 | 22 | 0 | 28 | 20 |
| 16 Jul - 29 Jul | 6 | 5 | 4 | 0 | 15 | 11 |
| 30 Jul - 12 Aug | 69 | 0 | 0 | 0 | 69 | 40 |
| 13 Aug - 26 Aug | 0 | 0 | 0 | 0 | 0 | -- |
| 27 Aug - 09 Sep | 0 | 0 | 0 | 0 | 0 | |
| Total | 81 | 10 | 26 | 7 | 124 | |
| SE | 42 | 7 | 20 | 7 | 47 | |
| Percent of harvest | 65% | 8% | 21% | 6% | | |
| Total catch of chinook salmon | | | | | | |
| 07 May - 20 May | 0 | 0 | 0 | 46 | 46 | 23 |
| 21 May - 03 Jun | 0 | 0 | 0 | 8 | 8 | 4 |
| 04 Jun - 17 Jun | 0 | 0 | 0 | 36 | 36 | 23 |
| 18 Jun - 01 Jul | 0 | 5 | 0 | 7 | 12 | 13 |
| 02 Jul - 15 Jul | 11 | 0 | 53 | 0 | 64 | 44 |
| 16 Jul - 29 Jul | 28 | 8 | 4 | 0 | 40 | 21 |
| 30 Jul - 12 Aug | 96 | 20 | 0 | 0 | 116 | 47 |
| 13 Aug - 26 Aug | 7 | 110 | 0 | 57 | 174 | 56 |
| 27 Aug - 09 Sep | 0 | 22 | 11 | 0 | 33 | 13 |
| Total | 142 | 165 | 68 | 154 | 529 | |
| SE | 51 | 44 | 44 | 52 | 96 | |
| Percent of catch | 27% | 31% | 13% | 29% | | |
| Percent retained | 96% | 63% | 60% | 40% | 65% | |

as a total of 174 chinook salmon (SE = 56) were caught during the biweekly period from 13 to 26 August. Most chinook salmon caught at Fish Creek were retained, but only 60% to 63% of the chinook salmon caught at Auke Bay floats and Auke Creek mouth were retained. The low retention rate (40%) at the other saltwater sites is due to many of the fish caught being of sublegal size.

A total of 32 large and 16 small chinook salmon was inspected for missing adipose fins (Appendix A8), and contribution estimates by tag lot were calculated (Table 7). A small chinook salmon taken at the mouth of Auke Creek in late June and one taken illegally at Sunrise Beach were immature, but all of the other chinook salmon sampled were mature. All of the age 3-ocean chinook salmon sampled from the roadside fisheries were at least 28 inches in length; however, only 2 of 7 sampled age 2-ocean fish were at least 28 inches long.

Hatchery fish were observed only at Fish Creek and the Auke Bay area (Auke Bay floats and Auke Creek mouth). Contribution estimates by tag code for these locations totaled 296, while the total estimate of chinook salmon harvested at these sites was 282. This discrepancy occurred because not all of the hatchery chinook salmon are tagged or marked, and therefore, due to random chance, the proportion of tagged fish sampled did not exactly correspond to the known tagging fractions. Since on other sampling occasions we might underestimate hatchery contributions due to random chance, the hatchery contributions by tag code were not adjusted (reduced) to reflect the estimated harvest. All tag codes from fish harvested at each site were from fish released at the site, indicating a minimal amount of straying. Age classes from 1-ocean to 4-ocean were harvested in the Auke Bay area, but in Fish Creek only age 2-ocean and 3-ocean fish were taken.

Coho Salmon Fisheries

An estimated 1,334 (SE = 242) large coho salmon were harvested on the Juneau roadside during 1990 out of a total catch of 1,867 (SE = 300) (Table 8). An additional 8,651 (SE = 1,731) jack coho salmon were caught, of which 7,208 (SE = 1,560) were harvested (Table 9). Distribution of catch and harvest of the large coho salmon was very different from that of the jack coho salmon. About 95% of the jack coho salmon were harvested at Fish Creek and Gastineau Hatchery, where large releases of hatchery coho salmon occurred in the spring of 1990 (see Table 2). Only 14% of the harvest of large coho salmon occurred at these two sites, as 72% of the harvest of large coho salmon occurred at Cowee, Peterson, and Montana creeks. About 48% of the total harvest of large coho salmon occurred at Cowee Creek. Saltwater beaches other than the one near the Gastineau Hatchery produced about 12% of the large coho salmon.

Most of the large coho salmon caught in salt water were retained, as were fish caught at Fish Creek and Mendenhall Ponds, two hatchery release sites (Table 8). Catch and release fishing was practiced more at Peterson and Montana creeks where over 50% of the large coho salmon caught were released. About 83% of the jack coho salmon caught were retained.

Of 935 total coho salmon inspected for missing adipose fins, 219 were large and 716 were jack coho salmon (Appendix A9). Hatchery coho salmon contributed to the sport fishery at 8 sites: calculated hatchery contributions totaled 4,535 (SE = 884) (Table 10). Of those fish released in 1989, the tag lot (04-31-53) released at Fish Creek produced the largest number (156) of large coho salmon for Juneau roadside anglers. Since hatchery coho salmon were released in 1989 at only four

Table 7. Estimates of hatchery-produced chinook salmon contributed to Juneau roadside sport fisheries during 1990.

| Sport fishery | Hatchery | Release site | Release year | Tag code | Recov.[a] | Contr.[b] | Var. of contr.[c] |
|---|---|---|---|---|---|---|---|
| Auke Bay area[d] | Snettisham | Auke C. | 86 | 04-26-01 | 1 | 13 | 168 |
| | | | 86 | 04-26-03 | 2 | 15 | 145 |
| | | | 86 | 04-26-08 | 2 | 13 | 141 |
| | | | 87 | 04-27-43 | 1 | 22 | 510 |
| | | | 87 | 04-27-50 | 1 | 7 | 78 |
| | | | 88 | 04-29-61 | 3 | 30 | 433 |
| | | | 88 | 04-29-62 | 1 | 11 | 176 |
| | | | 89 | 04-32-01 | 2 | 35 | 1,239 |
| Fish Creek | | Fish C. | 87 | 04-27-42 | 1 | 13 | 275 |
| | | | 88 | 04-30-01 | 3 | 137 | 8,525 |
| | | TOTAL | | | 17 | 296 | 11,690 |

[a] Recov. = Number of fish recovered of noted tag code.

[b] Contr. = Estimated harvest of the release of the noted tag code.

[c] Var. of Contr. = Variance of estimated harvest of the release of the noted tag code.

[d] Includes sport fisheries at mouth of Auke Creek and at Auke Bay floats.

Table 8. Harvest and catch of large coho salmon for major fisheries on the Juneau roadside by biweekly period during 1990.

| Biweek | Freshwater | | | | | Saltwater | | Total | SE |
|---|---|---|---|---|---|---|---|---|---|
| | Cowee Creek | Peterson Creek | Montana Creek | Mendenhall ponds | Fish Creek | Gastineau Hatchery | Other saltwater sites pooled | | |
| Large coho salmon (>16") harvested | | | | | | | | | |
| 13 Aug - 26 Aug | 15 | 0 | 0 | -- | 12 | 0 | 64 | 91 | 36 |
| 27 Aug - 09 Sep | 135 | 2 | 36 | -- | 29 | 22 | 70 | 294 | 65 |
| 10 Sep - 23 Sep | 340 | 43 | 63 | 0 | 26 | 22 | 5 | 499 | 137 |
| 24 Sep - 07 Oct | 152 | 66 | 114 | 0 | 43 | 13 | 0 | 388 | 183 |
| 08 Oct - 21 Oct | 3 | 0 | 2 | 13 | 10 | 12 | 3 | 43 | 23 |
| 22 Oct - 04 Nov | -- | -- | -- | 0 | 0 | 0 | 19 | 19 | 23 |
| Total | 645 | 111 | 215 | 13 | 120 | 69 | 161 | 1,334 | |
| SE | 167 | 142 | 76 | 10 | 38 | 35 | 40 | 242 | |
| Percent of total harvest | 48% | 8% | 16% | 1% | 9% | 5% | 12% | | |
| Total catch of large coho salmon (>16") | | | | | | | | | |
| 13 Aug - 26 Aug | 15 | 0 | 0 | -- | 12 | 4 | 65 | 96 | 36 |
| 27 Aug - 09 Sep | 179 | 4 | 36 | -- | 29 | 22 | 70 | 340 | 92 |
| 10 Sep - 23 Sep | 452 | 75 | 244 | 0 | 26 | 22 | 5 | 824 | 206 |
| 24 Sep - 07 Oct | 152 | 175 | 160 | 0 | 43 | 13 | 0 | 543 | 191 |
| 08 Oct - 21 Oct | 3 | 0 | 2 | 13 | 10 | 12 | 5 | 45 | 25 |
| 22 Oct - 04 Nov | -- | -- | -- | 0 | 0 | 0 | 19 | 19 | 23 |
| Total | 801 | 254 | 442 | 13 | 120 | 73 | 164 | 1,867 | |
| SE | 208 | 138 | 150 | 10 | 38 | 35 | 40 | 300 | |
| Percent of total catch | 43% | 14% | 24% | 1% | 6% | 4% | 9% | | |
| Percent retained | 81% | 44% | 49% | 100% | 100% | 95% | 98% | 71% | |

Table 9. Harvest and catch of jack coho salmon for major fisheries on the Juneau roadside by biweekly period during 1990.

| Biweek | Site: Fish Creek | Other freshwater sites pooled | Gastineau Hatchery | Other saltwater sites pooled | Total | SE |
|---|---|---|---|---|---|---|
| Jack coho salmon (<16") harvested | | | | | | |
| 13 Aug - 26 Aug | 341 | 0 | 0 | 3 | 344 | 178 |
| 27 Aug - 09 Sep | 248 | 53 | 100 | 4 | 405 | 150 |
| 10 Sep - 23 Sep | 460 | 115 | 3,780 | 3 | 4,358 | 1,466 |
| 24 Sep - 07 Oct | 207 | 60 | 1,556 | 0 | 1,823 | 454 |
| 08 Oct - 21 Oct | 29 | 111 | 90 | 3 | 233 | 156 |
| 22 Oct - 04 Nov | -- | 45 | 0 | 0 | 45 | 34 |
| Total | 1,285 | 384 | 5,526 | 13 | 7,208 | |
| SE | 339 | 125 | 1,518 | 7 | 1,560 | |
| Percent of total harvest | 18% | 5% | 77% | <0.5% | | |
| Total catch of jack coho salmon (<16") | | | | | | |
| 13 Aug - 26 Aug | 432 | 6 | 0 | 19 | 457 | 209 |
| 27 Aug - 09 Sep | 248 | 86 | 165 | 13 | 512 | 174 |
| 10 Sep - 23 Sep | 629 | 127 | 4,598 | 4 | 5,358 | 1,630 |
| 24 Sep - 07 Oct | 273 | 120 | 1,558 | 0 | 1,951 | 463 |
| 08 Oct - 21 Oct | 29 | 206 | 90 | 3 | 328 | 226 |
| 22 Oct - 04 Nov | -- | 45 | 0 | 0 | 45 | 34 |
| Total | 1,611 | 590 | 6,411 | 39 | 8,651 | |
| SE | 368 | 219 | 1,677 | 16 | 1,731 | |
| Percent of total catch | 19% | 7% | 74% | <0.5% | | |
| Percent retained | 80% | 65% | 86% | 33% | 83% | |

Table 10. Estimates of hatchery produced coho salmon contributed to Juneau roadside sport fisheries during 1990.

| Sport fishery | Hatchery or wild stock | Release site | Release year | Tag code | Recov.[a] | Contr.[b] | Var. of contr.[c] |
|---|---|---|---|---|---|---|---|
| Cowee Creek | Snettisham | Fish C. | 90 | 04-29-53 | 1 | 32 | 1,305 |
| Picnic Cove | Snettisham | Sheep C. | 89 | 04-31-54 | 1 | 28 | ---[d] |
| Montana Creek | Snettisham | Mendenhall ponds | 88 | 04-29-49 | 1 | 16 | 245 |
| | | | 89 | 04-31-55 | 3 | 23 | 258 |
| | | | 90 | 04-32-37 | 4 | 27 | 242 |
| Auke Bay area | Snettisham | Fish C. | 90 | 04-29-53 | 1 | 3 | --- |
| | | | 90 | 04-32-35 | 1 | 6 | --- |
| Mendenhall ponds | Snettisham | Fish C. | 90 | 04-32-35 | 1 | 34 | --- |
| | | Mendenhall ponds | 90 | 04-32-37 | 2 | 61 | 4,837 |
| Gastineau Hatchery | Gastineau | Gastineau H. | 89 | 04-32-31 | 5 | 96 | 3,353 |
| | | | 90 | 04-34-20 | 2 | 162 | 13,514 |
| | | | 90 | 04-34-21 | 2 | 453 | 153,169 |
| | | | 90 | 04-34-24 | 2 | 132 | 8,607 |
| | | Sheep C. | 90 | 04-34-19 | 3 | 521 | 157,326 |
| | | | 90 | 04-34-22 | 7 | 832 | 186,447 |
| | | | 90 | 04-34-23 | 6 | 823 | 190,552 |
| | Snettisham | Sheep C. | 89 | 04-31-54 | 1 | 17 | 264 |
| Sheep Creek | Gastineau | Gastineau H. | 89 | 04-32-31 | 1 | 4 | 16 |
| Fish Creek | Gastineau | Gastineau H. | 89 | 04-32-31 | 1 | 6 | 36 |
| | Snettisham | Fish C. | 90 | 04-29-53 | 58 | 616 | 35,167 |
| | | | 90 | 04-31-46 | 10 | 109 | 2,066 |
| | | | 89 | 04-31-53 | 10 | 156 | 4,363 |
| | | | 90 | 04-32-35 | 60 | 378 | 19,949 |
| | | HATCHERY TOTAL | | | 183 | 4,535 | 781,716 |
| | Wild stock | Auke Creek | 89 | 04-28-54 | 2 | 10 | 173 |

[a] Recov. = Number of fish recovered of noted tag code.

[b] Contr. = Estimated harvest of the release of the noted tag code.

[c] Var. of Contr. = Variance of estimated harvest of the release of the noted tag code.

[d] No variance could be calculated because only one recovery in a sampling stratum.

sites, some of these hatchery coho salmon strayed to areas other than their release sites, while others were probably intercepted on their way to release sites. Recovery of a jack coho salmon released at Fish Creek in the Cowee Creek fishery indicates that straying to systems far from release points can occur. Hatchery coho salmon released at Sheep Creek were almost all recovered at the Gastineau Hatchery. At the mouth of Montana Creek, about 75 hatchery coho salmon were probably intercepted on their way upstream to their Mendenhall ponds release site, although some may have been straying to Montana Creek.

Percent hatchery contributions of coho salmon for the 8 sites varied from 5% at Cowee Creek to 90% at Fish Creek (Table 11). Overall, 53% of the coho salmon harvested on the Juneau roadside were of hatchery origin. An estimated 92% of the hatchery fish were jack coho salmon. At the Fish Creek site, most recoveries of jack coho salmon from releases of early run Pavlof River coho salmon stock (tag codes 4-29-53 and 4-31-46) occurred during the two biweeks from 13 August to 9 September. Most recoveries of the release of Speel Lake stock (tag code 4-32-35) occurred in the two biweeks from 10 September to 7 October.

Pink and Chum Salmon Fisheries

Pink salmon was the species of fish both caught and harvested in the highest numbers on the Juneau roadside: an estimated 26,682 (SE = 2,947) were caught and 11,925 (SE = 1,375) harvested (Table 12). Pink salmon were harvested from late June until mid-September. Harvest of pink salmon peaked in the biweek from 30 July to 12 August, although catches peaked in the following biweek. About 58% of the harvest occurred from southern saltwater beaches where pink salmon were returning to Gastineau Hatchery. About 21% of the harvest occurred at freshwater sites. Overall, about 45% of the pink salmon caught were retained, with the lowest retention rate of 37% occurring in fresh water.

Catches of chum salmon totaled 8,424 (SE = 1,870) with 3,602 (SE = 745) harvested (Table 13). Run timing of chum salmon was very similar to that for pink salmon, although chum salmon harvests peaked from 16 July to 29 July, two weeks earlier than peak harvests of pink salmon. Most harvest (97%) of chum salmon occurred in the southern saltwater sites in Gastineau Channel. A targeted fishery for chum salmon at Sheep Creek took an estimated 3,211 (SE = 739) chum salmon (Appendix A6).

Dolly Varden and Cutthroat Trout Fisheries

An estimated 3,103 (SE = 425) Dolly Varden were harvested from a total catch of 5,192 (SE = 535) fish (Table 14). Catches and harvests of Dolly Varden occurred throughout the period surveyed, with the exception of the biweek from 22 October to 4 November. Dolly Varden are targeted most often in the spring when most species of salmon are not available. Harvests of Dolly Varden peaked in the first biweek of 7 May to 20 May, and some harvest undoubtedly occurred before surveys began. About 78% of the harvest occurred in salt water, with harvests fairly well distributed in the northern, central, and southern areas. Most saltwater harvest occurred by late July, while freshwater harvests peaked in late June and July. Overall, about 60% of the Dolly Varden caught were retained.

A total of 370 Dolly Varden was checked for floy tags and upper caudal fin clips (Appendix A10). A Dolly Varden of 520mm in fork length with an upper caudal fin clip was recovered on 29 May at Picnic Cove. Additionally, an orange floy-tagged

Table 11. Hatchery contributions of coho salmon for major fisheries on the Juneau roadside by site during 1990.

| Site(s) | Total harvest | Hatchery contribution | |
|---|---|---|---|
| | | Number | Percent of total harvest |
| Northern saltwater beaches | 39 | 0 | 0% |
| Central saltwater beaches | | | |
| Picnic Cove | 42 | 28 | 67% |
| Auke Bay area | 19 | 9 | 47% |
| Other beaches | 49 | 0 | 0% |
| Subtotal | 110 | 37 | 34% |
| Southern saltwater beaches | | | |
| Gastineau Hatchery | 5,595 | 3,036 | 54% |
| Sheep Creek | 25 | 4 | 16% |
| Subtotal | 5,620 | 3,040 | 54% |
| Freshwater sites | | | |
| Cowee Creek | 661 | 32 | 5% |
| Peterson Creek | 188 | 0 | 0% |
| Montana Creek | 364 | 66 | 18% |
| Mendenhall ponds | 155 | 95 | 61% |
| Fish Creek | 1,405 | 1,265 | 90% |
| Subtotal | 2,773 | 1,458 | 53% |
| Total | 8,542 | 4,535 | 53% |

Table 12. Harvest and catch of pink salmon for major fisheries on the Juneau roadside by biweekly period during 1990.

| Biweek | Site grouping: Northern saltwater | Central saltwater | Southern saltwater | Freshwater | Total | SE |
|---|---|---|---|---|---|---|
| Pink salmon harvested | | | | | | |
| 18 Jun - 01 Jul | 56 | 49 | 5 | 0 | 110 | 49 |
| 02 Jul - 15 Jul | 235 | 279 | 69 | 33 | 616 | 163 |
| 16 Jul - 29 Jul | 215 | 376 | 1,994 | 859 | 3,444 | 693 |
| 30 Jul - 12 Aug | 49 | 289 | 3,016 | 863 | 4,217 | 870 |
| 13 Aug - 26 Aug | 198 | 662 | 1,668 | 354 | 2,882 | 761 |
| 27 Aug - 09 Sep | 7 | 122 | 158 | 365 | 652 | 215 |
| 10 Sep - 23 Sep | 0 | 0 | 0 | 4 | 4 | 3 |
| Total | 760 | 1,777 | 6,910 | 2,478 | 11,925 | |
| SE | 258 | 539 | 1,139 | 486 | 1,375 | |
| Percent of total harvest | 6% | 15% | 58% | 21% | | |
| Total catch of pink salmon | | | | | | |
| 18 Jun - 01 Jul | 56 | 49 | 5 | 0 | 110 | 49 |
| 02 Jul - 15 Jul | 303 | 285 | 69 | 85 | 742 | 174 |
| 16 Jul - 29 Jul | 215 | 544 | 2,154 | 1,451 | 4,364 | 832 |
| 30 Jul - 12 Aug | 206 | 373 | 5,825 | 2,517 | 8,921 | 1,689 |
| 13 Aug - 26 Aug | 433 | 1,583 | 5,862 | 1,421 | 9,299 | 2,083 |
| 27 Aug - 09 Sep | 26 | 1,007 | 906 | 1,282 | 3,221 | 877 |
| 10 Sep - 23 Sep | 0 | 0 | 0 | 25 | 25 | 24 |
| Total | 1,239 | 3,841 | 14,821 | 6,781 | 26,682 | |
| SE | 405 | 855 | 2,607 | 998 | 2,947 | |
| Percent of total catch | 5% | 14% | 56% | 25% | | |
| Percent retained | 61% | 46% | 47% | 37% | 45% | |

Table 13. Harvest and catch of chum salmon for major fisheries on the Juneau roadside by biweekly period during 1990.

| Biweek | Site grouping: Northern saltwater | Central saltwater | Southern saltwater | Freshwater | Total | SE |
|---|---|---|---|---|---|---|
| Chum salmon harvested | | | | | | |
| 18 Jun - 01 Jul | 0 | 8 | 0 | 0 | 8 | 7 |
| 02 Jul - 15 Jul | 0 | 4 | 603 | 6 | 613 | 179 |
| 16 Jul - 29 Jul | 0 | 10 | 2,432 | 38 | 2,480 | 682 |
| 30 Jul - 12 Aug | 2 | 0 | 341 | 17 | 360 | 225 |
| 13 Aug - 26 Aug | 7 | 9 | 116 | 0 | 132 | 84 |
| 27 Aug - 09 Sep | 0 | 4 | 5 | 0 | 9 | 10 |
| Total | 9 | 35 | 3,497 | 61 | 3,602 | |
| SE | 8 | 15 | 744 | 35 | 745 | |
| Percent of total harvest | <0.5% | 1% | 97% | 2% | | |
| Total catch of chum salmon | | | | | | |
| 18 Jun - 01 Jul | 0 | 8 | 0 | 0 | 8 | 7 |
| 02 Jul - 15 Jul | 0 | 4 | 803 | 6 | 813 | 255 |
| 16 Jul - 29 Jul | 0 | 60 | 4,734 | 172 | 4,966 | 1,601 |
| 30 Jul - 12 Aug | 2 | 0 | 2,020 | 40 | 2,062 | 896 |
| 13 Aug - 26 Aug | 45 | 21 | 359 | 6 | 431 | 150 |
| 27 Aug - 09 Sep | 5 | 124 | 11 | 4 | 144 | 209 |
| Total | 52 | 217 | 7,927 | 228 | 8,424 | |
| SE | 33 | 210 | 1,857 | 67 | 1,870 | |
| Percent of total catch | 1% | 3% | 94% | 3% | | |
| Percent retained | 17% | 16% | 44% | 27% | 43% | |

Table 14. Harvest and catch of Dolly Varden for major fisheries on the Juneau roadside by biweekly period during 1990.

| Biweek | Site grouping: Northern saltwater | Central saltwater | Southern saltwater | Freshwater | Total | SE |
|---|---|---|---|---|---|---|
| Dolly Varden harvested | | | | | | |
| 07 May - 20 May | 187 | 261 | 321 | 0 | 769 | 252 |
| 21 May - 03 Jun | 44 | 11 | 100 | 0 | 155 | 48 |
| 04 Jun - 17 Jun | 450 | 30 | 57 | 0 | 537 | 249 |
| 18 Jun - 01 Jul | 75 | 183 | 4 | 151 | 413 | 106 |
| 02 Jul - 15 Jul | 23 | 19 | 76 | 170 | 288 | 84 |
| 16 Jul - 29 Jul | 3 | 0 | 339 | 135 | 477 | 159 |
| 30 Jul - 12 Aug | 0 | 45 | 110 | 5 | 160 | 62 |
| 13 Aug - 26 Aug | 0 | 2 | 39 | 37 | 78 | 41 |
| 27 Aug - 09 Sep | 0 | 0 | 14 | 46 | 60 | 37 |
| 10 Sep - 23 Sep | 0 | 0 | 0 | 53 | 53 | 22 |
| 24 Sep - 07 Oct | 0 | 0 | 30 | 49 | 79 | 34 |
| 08 Oct - 21 Oct | -- | -- | 0 | 34 | 34 | 25 |
| Total | 782 | 551 | 1,090 | 680 | 3,103 | |
| SE | 271 | 163 | 247 | 137 | 425 | |
| Percent of total harvest | 25% | 18% | 35% | 22% | | |
| Total catch of Dolly Varden | | | | | | |
| 07 May - 20 May | 211 | 513 | 613 | 0 | 1,337 | 319 |
| 21 May - 03 Jun | 109 | 47 | 120 | 3 | 279 | 81 |
| 04 Jun - 17 Jun | 531 | 101 | 57 | 0 | 689 | 262 |
| 18 Jun - 01 Jul | 89 | 323 | 44 | 175 | 631 | 158 |
| 02 Jul - 15 Jul | 68 | 19 | 208 | 281 | 576 | 154 |
| 16 Jul - 29 Jul | 59 | 0 | 448 | 187 | 694 | 175 |
| 30 Jul - 12 Aug | 18 | 45 | 116 | 68 | 247 | 75 |
| 13 Aug - 26 Aug | 0 | 80 | 47 | 49 | 176 | 64 |
| 27 Aug - 09 Sep | 0 | 0 | 43 | 185 | 228 | 117 |
| 10 Sep - 23 Sep | 7 | 6 | 0 | 137 | 150 | 60 |
| 24 Sep - 07 Oct | 0 | 0 | 30 | 97 | 127 | 42 |
| 08 Oct - 21 Oct | -- | -- | 5 | 53 | 58 | 41 |
| Total | 1,092 | 1,134 | 1,731 | 1,235 | 5,192 | |
| SE | 293 | 240 | 309 | 219 | 535 | |
| Percent of total catch | 21% | 22% | 33% | 24% | | |
| Percent retained | 72% | 49% | 63% | 55% | 60% | |

(Tag No. 05811) Dolly Varden was recovered at Echo Cove on 15 June (305mm fork length), and a gray floy-tagged (Tag No. 02117) Dolly Varden was recovered at Echo Cove on 30 June (410 mm fork length).

Fork lengths of 218 Dolly Varden were also measured from the sites sampled (Table 15). About 31% of the 178 Dolly Varden taken in salt water had total lengths greater than 16 inches (400 mm fork length), but only 10% of the 40 Dolly Varden taken in fresh water had total lengths greater than 16 inches. Only 17% of the Dolly Varden taken in salt water had lengths less than 12 inches (300 mm fork length), while 33% of the Dolly Varden taken in fresh water were of this size class. Average fork length of the 178 Dolly Varden taken in salt water was 14.3 inches (364 mm) (SE = 0.2 inches). The 40 Dolly Varden harvested in fresh water had an average fork length of 13.3 inches (338 mm) (SE = 0.4 inches).

A total of 295 (SE = 72) cutthroat trout was harvested during the surveys, 85% of which were taken at the freshwater sites. The retention rate for cutthroat trout caught was 85%, as the catch totaled 346 (SE = 77). Peak harvests and catches of cutthroat trout occurred in September.

## DISCUSSION

### Validity of the Sampling Design

It was not possible to test all of the assumptions upon which the study design was based. Since angling effort was dispersed so widely across the roadside, sampling effort could not be allocated to effectively gather large numbers of completed-trip interviews of anglers. Since uncompleted-trip interviews were used in the harvest estimates, it is likely that harvest estimates are biased to some degree, especially for fish species with restrictive bag limits or for those in which harvest or catch rates are low. Uncompleted-trip harvest rates are often negatively biased in these situations and therefore lead to underestimates of total harvest or catch. Because the same sampling design was used at all of the release sites during evaluations of hatchery releases of chinook and coho salmon, this bias should be relatively constant, and our comparisons of the values of different release sites and strategies would be valid.

The 1989 roadside studies had a very similar sampling design which also relied on uncompleted-trip interviews (Suchanek and Bingham 1990a). Estimates from these studies can be compared to estimates from Mills (1990) which also generated 1989 harvest estimates for the Juneau roadside. Mills (1990) reported a Juneau roadside freshwater harvest estimate of 21 chinook salmon and 272 coho salmon during 1989. Suchanek and Bingham (1990a) reported a harvest of 280 chinook salmon, 154 large coho salmon, and 1,978 jack coho salmon in the two freshwater sites (Fish Creek and Mendenhall Ponds) they surveyed during 1989. It does not appear from this crude comparison that Suchanek and Bingham (1990) seriously underestimated chinook and coho salmon harvests in fresh water on the Juneau roadside.

### Angler Effort

The last two comprehensive surveys of the Juneau roadside fisheries were completed in 1983 (Neimark 1984) and 1987 (Bingham et al. 1988). Prior to 1983, other roadside surveys were done in 1960 (Baade 1961), 1972 (Schmidt, Robards, and McHugh 1973), and 1977-1979 (Robards 1978, Marriott et al. 1979, Schwan 1980)

Table 15. Number of Dolly Varden sampled by size class and fishery on the Juneau roadside during 1990.

| | Salt water | | | | | | |
|---|---|---|---|---|---|---|---|
| Size class[a] | Northern | Central | Southern | Total | (%) | Fresh water (%) | Total (%) |
| <12 inches | 13 | 2 | 15 | 30 | (17%) | 13 (33%) | 43 (20%) |
| 12 - 14 inches | 13 | 16 | 25 | 54 | (30%) | 10 (25%) | 64 (29%) |
| 14 - 16 inches | 16 | 11 | 11 | 38 | (21%) | 13 (33%) | 51 (23%) |
| >16 inches | 18 | 21 | 17 | 56 | (31%) | 4 (10%) | 60 (28%) |
| TOTAL | 60 | 50 | 68 | 178 | (99%) | 40 (101%) | 218 (100%) |

[a] Size classes are total lengths which correspond to fork lengths of ≤300 mm, 301-350 mm, 351-400 mm, and ≥400 mm

Table 16. Angler-hours of effort for major fisheries on the Juneau roadside during 1983, 1987, and 1990.

| | | | Site Grouping | | | | |
|---|---|---|---|---|---|---|---|
| Year | Dates of survey | | Northern saltwater | Central saltwater | Southern saltwater | Freshwater | Total |
| 1983 | 17 April-29 Oct. | Effort | 15,588 | 23,127 | 10,568 | 8,421[a] | 57,704 |
| | | Percent of total | 27% | 40% | 18% | 15% | |
| 1987 | 20 April-11 Oct. | Effort | 16,332 | 11,340 | 7,277 | 12,555[b] | 47,504 |
| | | Percent of total | 34% | 24% | 15% | 26% | |
| 1990 | 7 May-4 Nov. | Effort | 5,652 | 14,997 | 15,769 | 12,733[c] | 49,151 |
| | | Percent of total | 12% | 31% | 32% | 26% | |

[a] This total does not include 2,900 angler-hours of effort at Twin Lakes.
[b] This total does not include 1,179 angler-hours of effort at Twin Lakes.
[c] This total includes 1,420 angler-hours of effort at Peterson Creek during 2 May to 5 June (Harding and Jones 1991).

although these surveys extended only through early September. Comparisons of the 1990 surveys will be largely limited to those done in 1983 and 1987, as these were most similar in survey methodology.

Although sites and time periods sampled varied somewhat for the 1983, 1987, and 1990 surveys, all were designed to overview the major roadside fisheries. The 1990 survey differed from the two prior surveys in that two major fisheries were not surveyed during the course of this study. These two fisheries included a fishery in Twin Lakes for landlocked salmon and a spring fishery in Peterson Creek for steelhead trout *Oncorhynchus mykiss*. An average of 2,040 angler hours of effort were expended in the Twin Lakes fishery during 1983 and 1987, but this fishery was not surveyed in 1990. The Peterson Creek steelhead fishery was surveyed during 1990 and 1,420 angler-hours of effort were expended from 2 May to 5 June (Harding and Jones 1991).

Duration of the 1990 surveys was also somewhat different than in 1983 and 1987. The 1990 Juneau roadside surveys were initiated on 7 May and ended on 4 November while in 1983 surveys ran from 17 April through 29 October and in 1987 surveys ran from 20 April to 11 October. Since fishing effort during the first and last portions of the season is generally small, the three surveys basically covered the same fisheries.

With the above mentioned caveats in mind, total angler effort on the Juneau roadside in 1987 and 1990 was very similar (Table 16). Distribution of angler effort varied somewhat as angler effort at the freshwater and southern saltwater sites appears to be increasing at the expense of the northern and central saltwater sites. This is partly due to the substantial enhancement efforts which have occurred in the southern portion of the Juneau roadside.

One major roadside fishery which was not surveyed during 1983, 1987, or 1990 was a sockeye salmon *Oncorhynchus nerka* fishery at Windfall Creek. Bethers and Glynn (1990) reported that an estimated 2,694 angler-hours of effort were expended in this fishery in 1989, although they noted that this amount of effort appeared to be higher than in any previous year based on casual observations of effort. In 1990, effort at Windfall Creek appeared to be higher than in 1989 (Mike Bethers, ADF&G, Division of Sport Fish, Juneau, personal communication), and the fishery was closed by emergency order on 20 June. This fishery may have reduced fishing effort during early June in other roadside areas as anglers fished Windfall Creek for sockeye salmon in preference to saltwater shoreline sites for Dolly Varden.

Chinook Salmon Fisheries

Very few chinook salmon have historically been taken on the Juneau roadside as the average harvest for the 1983 and 1987 surveys was less than 50 (Neimark 1984, Bingham et al. 1988). Harvests and catches of chinook salmon in 1990 were substantially greater as regulation changes and hatchery releases have provided increased opportunities for roadside anglers.

The major spring roadside fishery for chinook salmon in 1990 occurred at Picnic Cove where about 46 maturing large chinook salmon of presumably wild origin were taken (as none sampled were tagged). This sport fishery started in 1989 when an area around Taku Inlet closed to the taking of chinook salmon from 16 April to 14 June was reduced in size, opening the Picnic Cove area for chinook salmon anglers. Unfortunately, harvests of hatchery chinook salmon did not occur until early July. It would be desirable if hatchery chinook salmon returned to release

sites in May and June when only Dolly Varden are otherwise available. By early July, returning pink and chum salmon provide additional opportunities for roadside anglers.

Returns of age 1-ocean to 4-ocean chinook salmon to the Juneau enhancement sites generated some roadside sport fishing effort and harvest during 1990. Harvests and timing of the runs of hatchery chinook salmon in 1990 were very similar to those observed in 1989 by Suchanek and Bingham (1990a). As no harvest of maturing chinook salmon has been observed in late June during both years, creel surveys could be initiated about 1 July with little chance of missing substantial harvests at the hatchery release sites. It appears very little harvest of hatchery chinook by roadside anglers is occurring except at the release sites.

Since age 4-ocean chinook salmon returned in 1990, evaluation of the 1986 releases should be essentially complete, although a few age 5-ocean fish could return in 1991. The 1986 releases of hatchery chinook salmon have contributed to roadside fisheries as well as to boat sport fisheries and commercial fisheries (Table 17). Tag codes that contributed the largest numbers of fish to the sport fisheries also contributed relatively well to commercial fisheries. As noted in Suchanek and Bingham (1990a), direct releases of chinook salmon do not contribute as well per 1,000 smolts released as those in which fish are retained, fed, and imprinted before release. The relatively small contributions are probably due to a decrease in survival rates. For this reason, direct releases of chinook salmon at the Fish and Auke creek sites were discontinued in 1988 and 1989.

Coho Salmon Fisheries

Roadside fisheries for coho salmon have also been bolstered by releases of hatchery coho salmon and 1990 harvests were well above those seen in 1983 and 1987 (Table 18). Harvests of wild stocks of coho salmon, however, were also well above the 1983 and 1987 levels. Hatchery stocks are more apt to provide large returns of jack coho salmon which can support substantial fisheries. The harvest of large numbers of jack coho salmon in 1989 (Suchanek and Bingham 1990a) and 1990 is completely dependent on hatchery releases.

As with chinook salmon, local releases of hatchery coho salmon contribute to boat sport fisheries as well as to the roadside fisheries (Table 19). Sport contributions from 1989 releases of coho salmon totaled 329 fish (44%) to the roadside fisheries and 427 fish (56%) to the local boat sport fishery.

By examining contributions of coho salmon by anglers on a per-smolt-released basis, release sites may be evaluated on their effectiveness for enhancing sport fisheries (Table 19). As noted by Suchanek and Bingham (1990a), however, evaluations of coho salmon releases on the Juneau roadside have been confounded by variation in smolt size which is positively correlated to contributions to the fisheries. Releases of smolts approximately 40 grams in weight in 1989 led to very large returns of jack coho salmon and these releases continued to contribute relatively well to sport fisheries in 1990. Releases of these large smolts at Fish Creek in both 1989 and 1990 have contributed very well in comparison to releases at other sites. Continued creel survey evaluations in 1991 are necessary to better assess the value of the releases of very large smolts as well as the releases of early run Pavlof River stock coho salmon.

Straying occurs with some regularity in Juneau releases of hatchery coho salmon (Suchanek and Bingham 1990a). Hatchery coho salmon were not harvested at loca-

Table 17. Summary of contributions of hatchery chinook salmon for 1986 releases by tag lot on the Juneau roadside to sport and commercial fisheries, 1988-1990.

| Release Information | | | | Commercial contribution through 1990[d] | Sport contributions[a] | | | | | | Sport contribution per 1,000 smolt released |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Site | Release strategy[b] | No.[c] (tag lot) | Weight per fish (grams) | | 1988 boat | 1989 boat | 1989 roadside | 1990 boat | 1990 roadside | Total | |
| Montana Cr. | DIR | 28,335 (4-26-02) | 8.4 | 7 | 0 | 0 | 0 | 5 | 0 | 5 | 0.2 |
| Fish Cr. | DIR | 30,620 (4-26-05) | 7.5 | 19 | 0 | 0 | 0 | 5 | 0 | 5 | 0.2 |
| Auke Cr. | DIR | 26,896 (4-26-08) | 8.0 | 30 | 29 | 22 | 0 | 10 | 13 | 74 | 2.8 |
| Auke Cr. | RET | 29,003 (4-26-01) | 9.0 | 91 | 26 | 68 | 5 | 47 | 13 | 159 | 5.4 |
| Fish Cr. | IMP | 29,652 (4-26-07) | 8.4 | 66 | 29 | 4 | 54 | 3 | 0 | 90 | 3.0 |
| Auke Cr. | IMP | 29,737 (4-26-03) | 9.1 | 117 | 45 | 31 | 5 | 0 | 15 | 96 | 3.2 |
| Sheep Cr. | IMP | 30,280 (4-26-06) | 7.7 | 246 | 47 | 64 | 20 | 23 | 0 | 154 | 5.1 |
| | Total | 204,523 | --- | 576 | 176 | 189 | 84 | 93 | 41 | 583 | 2.9 |
| | Percent of Total Sport Contribution | | | | 30% | 32% | 14% | 16% | 7% | 100% | |

[a] Additional sport contribution data taken from Suchanek and Bingham (1989, 1990a, 1990b, 1991).

[b] DIR = Direct release.
RET = Retained and fed.
IMP = Retained, fed, and imprinted.

[c] No. = Number of fish released for noted tag lot.

[d] Contributions to commercial fisheries obtained from FRED division for years through 1990.

Table 18. Harvest and percent of coho salmon retained for major fisheries on the Juneau roadside during 1983, 1987, and 1990. These totals exclude harvests in Twin Lakes.

| Year | | Site Grouping | | | | |
|---|---|---|---|---|---|---|
| | | Northern saltwater | Central saltwater | Southern saltwater | Freshwater | Total |
| 1983[a] | Harvest | 120 | 141 | 0 | 271 | 532 |
| | Percent of total | 23% | 27% | 0% | 51% | |
| | Percent retained | 100% | 100% | -- | 20% | 33% |
| 1987 | Harvest of large coho | 43 | 0 | 0 | 254 | 297 |
| | Percent of total | 14% | 0% | 0% | 86% | |
| | Percent retained | 50% | -- | -- | 39% | 40% |
| | Harvest of jacks | 0 | 0 | 0 | 194 | 194 |
| | Percent of total | 0% | 0% | 0% | 100% | |
| | Percent retained | -- | -- | -- | 45% | 45% |
| 1990 | Harvest of large coho | 39 | 100 | 91 | 1,104 | 1,334 |
| | Percent of total | 3% | 7% | 7% | 83% | |
| | Percent retained | 98% | 100% | 94% | 68% | 71% |
| | Harvest of jacks | 0 | 10 | 5,529 | 1,669 | 7,208 |
| | Percent of total | 0% | <0.5% | 77% | 23% | |
| | Percent retained | -- | 53% | 86% | 76% | 83% |

[a] Harvests of large and jack coho salmon not separated in 1983, these totals assumed to include only large coho salmon.

Table 19. Summary of contributions of hatchery coho salmon releases by tag lot on the Juneau roadside to local sport fisheries, 1986-1990.[a]

| Release Information | | | Sport contribution[b] | | | Contribution |
|---|---|---|---|---|---|---|
| Site | No.[c] (tag lot) | Weight per fish (grams) | Roadside | Boat | Total | per 1,000 smolt released |
| 1986 Release | | | | | | |
| Salmon Creek | 20,422 (4-23-61) | 9.4 | 0 | 0 | 0 | 0.0 |
| 1987 Releases | | | | | | |
| Salmon Creek | 101,000 (4-27-28) | 3.5 | 0 | 0 | 0 | 0.0 |
| Fish Creek | 53,000 (4-27-29) | 7.8 | 12 | 0 | 12 | 0.2[d] |
| Sheep Creek | 39,442 (4-28-20) | 12.0 | 0 | 19 | 19 | 0.5 |
| Mendenhall ponds | 53,000 (4-27-30) | 3.4 | 41 | 12 | 53 | 1.0[d] |
| 1988 Releases | | | | | | |
| Fish Creek | 50,000 (4-29-48) | 12.5 | 100 | 77 | 177 | 3.5 |
| Sheep Creek | 100,000 (4-29-47) | 10.9 | 128 | 165 | 293 | 2.9 |
| Mendenhall ponds | 50,000 (4-29-49) | 6.8 | 55 | 55 | 110 | 2.2 |
| Gastineau Hatchery | 49,659 (4-30-15) | 20.9 | 426 | 172 | 598 | 12.0 |
| Auke Rec. area | 18,896 (4-30-14) | 16.0 | 50 | 115 | 165 | 8.7 |
| 1989 Releases | | | | | | |
| | | | 1989 contributions of jack coho salmon | | | |
| Fish Creek | 42,000 (4-31-53) | 39.5 | 814 | 9 | 823 | 19.6 |
| Sheep Creek | 44,940 (4-31-54) | 40.2 | 179 | 13 | 192 | 4.3 |
| Mendenhall ponds | 37,000 (4-31-55) | 38.5 | 840 | 59 | 899 | 24.3 |
| Gastineau Hatchery | 36,866 (4-32-31) | 19.0 | 6 | 0 | 6 | 0.2 |
| | | | 1990 contributions of large coho salmon | | | |
| Fish Creek | 42,000 (4-31-53) | 39.5 | 156 | 92 | 248 | 5.9 |
| Sheep Creek | 44,940 (4-31-54) | 40.2 | 45 | 117 | 162 | 3.6 |
| Mendenhall ponds | 37,000 (4-31-55) | 38.5 | 22 | 138 | 160 | 4.3 |
| Gastineau Hatchery | 36,866 (4-32-31) | 19.0 | 106 | 80 | 186 | 5.0 |
| 1990 Releases | | | | | | |
| | | | 1990 contributions of jack coho salmon | | | |
| Fish Creek | 20,376 (4-32-35) | 50.0 | 418 | 0 | 418 | 20.5 |
| | 20,860 (4-29-53) | 29.0 | 651 | 0 | 651 | 31.2 |
| | 6,420 (4-31-46) | 29.0 | 109 | 0 | 109 | 17.0 |
| Sheep Creek | 182,006 (4-34-19) | 22.7 | 521 | 0 | 521 | 2.8 |
| | 175,936 (4-34-22) | 21.9 | 832 | 0 | 832 | 4.7 |
| | 175,270 (4-34-23) | 22.4 | 823 | 0 | 823 | 4.7 |
| Mendenhall ponds | 25,843 (4-32-37) | 36.7 | 88 | 0 | 88 | 3.4 |
| Gastineau Hatchery | 182,874 (4-34-20) | 16.4 | 162 | 0 | 162 | 0.9 |
| | 184,391 (4-34-21) | 17.0 | 453 | 0 | 453 | 2.5 |
| | 179,001 (4-34-24) | 19.3 | 132 | 0 | 132 | 0.7 |

[a] This table does not include releases of coho salmon at Twin Lakes.

[b] Sport contribution data taken from Mecum and Suchanek (1987), Bingham, et al. (1988), and Suchanek and Bingham (1989, 1990a, 1990b, 1991).

[c] No. = Number of fish released for noted tag lot.

[d] Sport contributions from both of these two releases were due to coho salmon holding over for an additional year before outmigrating in 1988.

tions other than at release sites in large numbers during 1990, although some straying was noted. Since local stocks of wild coho salmon may be impacted by this straying, evaluation of this straying by tag lot should continue.

Pink and Chum Salmon Fisheries

About 12,000 to 16,000 pink salmon were taken in 1983, 1987 and 1990 (Table 20). Harvests in the southern saltwater sites made up from 45% to 68% of the total harvests as anglers targeted hatchery returns to Gastineau Channel release sites. The percentage of the pink salmon catch retained has declined from 57% in 1983 to 45% in 1990. Retention rates for pink salmon at the freshwater sites were lower than at the saltwater sites in 1987 and 1990.

The estimated chum salmon harvest of 3,602 in 1990 far exceeded the 235 taken in 1983 and the 371 taken in 1987. Chum salmon are generally not highly preferred by anglers in Southeast Alaska (Schwan 1984), and only 43% of the catch was retained in 1990. A large fishery developed at Sheep Creek in 1990 in response to very large returns of hatchery fish. About 97% of the chum salmon were harvested at southern saltwater sites in Gastineau Channel.

Dolly Varden Fisheries

Dolly Varden have been of conservation concern on the Juneau roadside since the 1970's as harvest rates for this species had been declining (Neimark 1984). The 1990 estimated harvest of 3,121 Dolly Varden was below that seen in 1983 and 1987 (Table 21). Retention rates for Dolly Varden during 1990 were also higher than in 1983 and 1987. In the late 1970's, over 8,000 Dolly Varden were taken annually (Robards 1978, Marriott et al. 1979, Schwan 1980). As noted by Neimark (1984), however, it is difficult to make comparisons when the type of sport fishing effort has changed dramatically over the years in that much more targeting is probably now occurring on pink salmon. It is not known if the decline in harvests and catches of Dolly Varden reflects a decrease in Dolly Varden abundance.

A decline in average size of fish taken in the sport harvest may potentially reflect a change in the population structure of local Dolly Varden stocks. No large differences in the length frequency distributions of Dolly Varden were noted between 1983 and 1990 although there were relatively more larger fish in 1983 (Figure 3). Fork lengths of Dolly Varden harvested in saltwater during 1990 (364 mm, SE = 5 mm) averaged only slightly smaller than fork lengths recorded in 1983 (372 mm, SE = 7 mm). Since relatively more fish were taken in the southern saltwater sites in 1990 than in 1983 (Table 21), it is possible that the stocks fished more heavily in 1990 were from different systems than those fished in 1983. Given these data, it is not known if the age structures of Dolly Varden stocks contributing to the roadside sport fisheries have changed in the last 7 years. More data need to be gathered to determine whether Dolly Varden stocks are declining in the Juneau area.

## CONCLUSIONS AND RECOMMENDATIONS

Large changes in Southeast Alaska sport fisheries have occurred over the past decade. Wild stocks of fish support most of the sport fisheries, but increasing enhancement efforts have led to increases in the harvests of chinook, coho, pink, and chum salmon on the Juneau roadside. During 1990, harvest survey programs showed that Juneau roadside anglers benefited greatly from the local enhancement

Table 20. Harvest and percent of pink salmon retained for major fisheries on the Juneau roadside during 1983, 1987, and 1990.

| Year | | Site Grouping: Northern saltwater | Central saltwater | Southern saltwater | Freshwater | Total |
|---|---|---|---|---|---|---|
| 1983 | Harvest | 2,118 | 3,358 | 5,697 | 1,490 | 12,663 |
| | Percent of total | 17% | 27% | 45% | 12% | |
| | Percent retained | 74% | 76% | 44% | 72% | 57% |
| 1987 | Harvest | 2,583 | 1,292 | 11,041 | 1,322 | 16,238 |
| | Percent of total | 16% | 8% | 68% | 8% | |
| | Percent retained | 93% | 54% | 54% | 21% | 51% |
| 1990 | Harvest | 760 | 1,777 | 6,910 | 2,478 | 11,925 |
| | Percent of total | 6% | 15% | 58% | 21% | |
| | Percent retained | 61% | 46% | 47% | 37% | 45% |

Table 21. Harvest and percent of Dolly Varden retained for major fisheries on the Juneau roadside during 1983, 1987, and 1990. These totals exclude catch and harvest at Twin Lakes.

| Year | | Site Grouping: Northern saltwater | Central saltwater | Southern saltwater | Freshwater | Total |
|---|---|---|---|---|---|---|
| 1983 | Harvest | 1,802 | 1,044 | 663 | 879 | 4,388 |
| | Percent of total | 41% | 24% | 15% | 20% | |
| | Percent retained | 49% | 60% | 47% | 27% | 43% |
| 1987 | Harvest | 1,180 | 371 | 692 | 1,392 | 3,635 |
| | Percent of total | 32% | 10% | 19% | 38% | |
| | Percent retained | 44% | 22% | 60% | 21% | 33% |
| 1990[a] | Harvest | 782 | 551 | 1,090 | 698 | 3,121 |
| | Percent of total | 25% | 18% | 35% | 22% | |
| | Percent retained | 72% | 49% | 63% | 30% | 50% |

[a] Totals include total catch of 1,092 Dolly Varden including 18 harvested at Peterson Creek from 2 May through 5 June (Harding and Jones 1991).

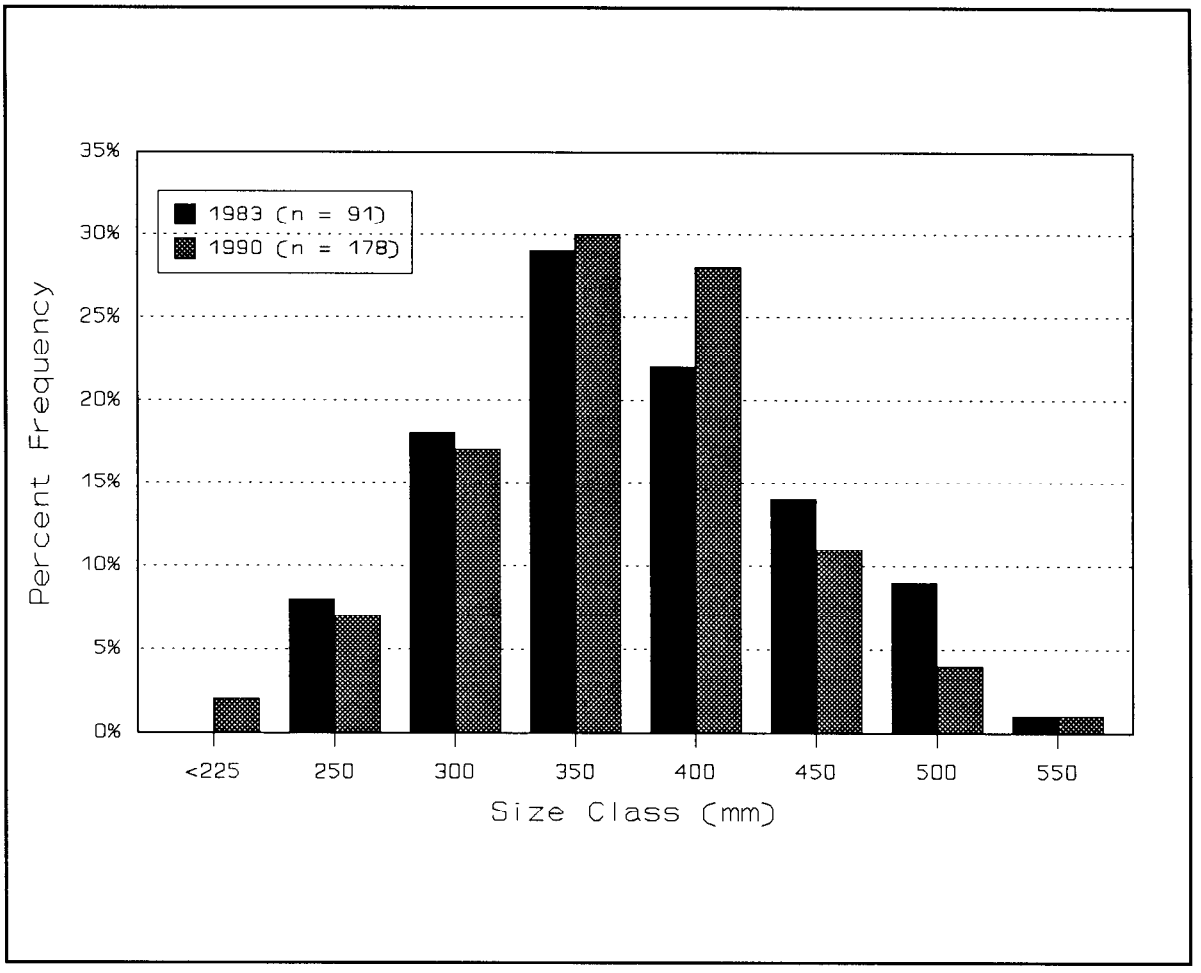


Figure 3. Comparison of lengths of Dolly Varden captured in Juneau roadside marine sport fisheries during 1983 and 1990.

efforts for all of these salmon species. These enhancement efforts can be costly, however, and creel sampling programs are instrumental in evaluating the success of these programs. In addition, these surveys provide valuable information for public education, proposed regulatory changes, comments on environmental impact statements, and baseline data on the fisheries. It is recommended that creel surveys of chinook and coho salmon enhancement sites be continued in 1991. A comprehensive survey of the Juneau roadside fisheries need not be done on an annual basis, but a comprehensive survey in 1993 would provide updated information on the Juneau roadside fisheries which could be used for a variety of purposes.

## ACKNOWLEDGMENTS

We wish to thank the Juneau roadside creel survey staff of Dale Brandenburger, Sue Millard, and Wayne Hall for their invaluable data collection efforts and suggestions to improve the survey. The ADFG staff of the Fisheries Rehabilitation, Enhancement, and Development (FRED) Division CWT lab are gratefully acknowledged for their work on dissecting salmon heads, coded-wire tag decoding, and data reduction efforts. We thank Donna Buchholz and Gail Heineman of the Research and Technical Services Unit (RTS) of the Division of Sport Fish for their diligence in mark sense form processing and data control.

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# APPENDIX A

Appendix A1. Descriptions of roadside fisheries surveyed in 1990.

Northern Saltwater Beaches (Lynn Canal area):

Echo Cove: (end of Glacier Highway-Mile 40) Fishery extends along the east side and south end of cove for about one-half mile.

North Bridget Cove: (Glacier Highway-Mile 37) The cove is located 200 yards from the parking area and fishery occurs in small cove.

South Bridget Cove: (Glacier Highway-Mile 36.5) The cove is located adjacent to the highway and occurs for several hundred yards around the cove.

Sunshine Cove: (Glacier Highway-Mile 36) This fishery extends for about 400 yards around cove and is accessible just off highway.

Sunrise Beach: (Glacier Highway-Mile 35.5) Small beach fishery is accessible just off highway along rocky shore.

End of Road Bluffs: (Glacier Highway-Mile 33) Small fishery along bluffs accessible from steep trails from two parking lots.

Amalga Harbor: (parking lot accessible from mile long access road extending west from Glacier Highway-Mile 24) Fishery occurs from boat launch area north one-quarter mile to mouth of Peterson Creek.

Shrine Island: (located at Shrine of St. Therese, Glacier Highway-Mile 23) Fishery occurs from rocks around Shrine Island.

Central Saltwater Beaches (Auke Bay and Fritz Cove area):

Point Louisa: This point is accessible from road in Auke Village Campground at Glacier Highway Mile 14.5. Fishery occurs from rocks for 300 yards along point.

Ferry Terminal: Fishery occurs along State Ferry Terminal located about a mile north of the Auke Bay Floats.

Auke Bay Floats: Fishery occurs from docks in Auke Bay which include Government Dock, Auke Launch Ramp, and DeHart's Marina.

Auke Creek Mouth: Located at the head of Auke Bay. The fishery at Auke Creek mouth occurs in saltwater near the mouth of the creek as the creek itself is closed to fishing. Shore anglers will be counted on the beach within one-quarter mile of the mouth.

Smugglers Cove: Located at the end of Fritz Cove road. Fishery extends along beach for about 400 yards.

Bay View Subdivision: (channel located near subdivision accessed from road at North Douglas Highway-Mile 8) Fishery is dispersed along channel for about 400 yards.

Fish Creek mouth: Located at the mouth of Fish Creek on Douglas Island. Fishery occurs along channels where Fish Creek runs into the most western portion of Gastineau Channel.

North Douglas Boat Ramp: (North Douglas Highway-Mile 9) Fishery is dispersed for about a mile east and west of boat launch ramp.

Picnic Cove: (North Douglas Highway-Mile 10) Fishing dispersed along 300 yards of cove immediately off parking area.

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Southern Saltwater Beaches (Gastineau Channel area):

Salmon Creek: Fishery located three miles north of Juneau adjacent to the south end of Twin Lakes and accessible from parking lots on both east and west sides of Egan Expressway. Fishery occurs downstream from Egan Expressway bridge where the area is defined as having saltwater regulations.

Gastineau Hatchery: This fishery developed for the first time during 1989 at the hatchery located about 3 miles north of Juneau along the Egan Expressway. Anglers fish from just north of the hatchery outfall along the shore several hundred yards to an old barge.

Sheep Creek: Located approximately four miles south of Juneau along Thane Road. This fishery occurs just downstream from the Thane Road bridge and includes only a saltwater area as this creek is closed to salmon fishing. Anglers will be counted and interviewed for about 250 yards north and south of the mouth.

Juneau-Douglas Bridge: Beach fishery located adjacent to the Juneau-Douglas Bridge and ADF&G Headquarters building.

Kowee Creek Mouth: (North Douglas Highway-Mile 0) Fishery occurs primarily in saltwater within 100 yards of mouth of Kowee Creek.

Freshwater Sites:

Cowee Creek: (Glacier Highway-Mile 39) Fishing occurs from 300 yards above bridge to about a mile below bridge.

Peterson Creek: (Glacier Highway-Mile 24) Fishery is dispersed from gorge one mile upstream of highway bridge to mouth, a distance of about 2.5 miles. This fishery includes the salt chuck just upstream of the mouth.

Montana Creek: (Upper, middle, and lower sites) Flows into the Mendenhall River one mile upstream from the Brotherhood Bridge. This fishery occurs only in freshwater from the mouth to approximately 5 miles upstream. The lower area includes the mouth of the creek and upstream approximately 200 yards and also the area approximately 100 yards downstream in the Mendenhall River. The middle area includes waters 400 yards both upstream and downstream of the Back Loop Road bridge. The upper area is much more dispersed and includes parking areas distributed along the Montana Creek road from approximately "the gorge" to the end of Montana Creek Road (a distance of about three miles).

Mendenhall Ponds: This system of small lakes is located north of the Mendenhall Back Loop Bridge, east of the Mendenhall River, and south of Mendenhall Lake (the ponds drain into the Mendenhall River). Fishing occurs primarily in the holding pond, outlet of holding pond, and in nearby Moose Lake, and these will be the only areas of the system surveyed. This site has been referred to in previous reports as Dredge Lakes.

Fish Creek: Located on Douglas Island and flows into Fritz Cove on north end of island. The fishery occurs primarily in an attached pond subjected to tidal influence about 100 meters downstream of the bridge, although anglers encountered from the pond to about 100 yard upstream of the North Douglas Highway bridge were interviewed.

Appendix A2. Listing of periods sampled and numbers of anglers counted and interviewed for all sites combined on the Juneau roadside during 1990.

| Sample Date | Biweek | Weekday or Weekend/Holiday Stratum | Sampling Period | | Length of Sample Period | Total Number of Anglers Counted | Number of Anglers Interviewed | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Start | End | | | Completed Trips | Uncompleted Trips | Total |
| 10MAY90 | 5/07-5/20 | WEEKDAY | 6:00 | 11:50 | 5.8 | 9 | 1 | 8 | 9 |
| 10MAY90 | 5/07-5/20 | WEEKDAY | 14:00 | 20:00 | 6.0 | 26 | 0 | 19 | 19 |
| 11MAY90 | 5/07-5/20 | WEEKDAY | 7:00 | 12:00 | 5.0 | 20 | 2 | 18 | 20 |
| 11MAY90 | 5/07-5/20 | WEEKDAY | 15:00 | 21:30 | 6.5 | 13 | 2 | 11 | 13 |
| 16MAY90 | 5/07-5/20 | WEEKDAY | 14:00 | 20:00 | 6.0 | 16 | 0 | 15 | 15 |
| 17MAY90 | 5/07-5/20 | WEEKDAY | 6:00 | 11:30 | 5.5 | 4 | 1 | 3 | 4 |
| 17MAY90 | 5/07-5/20 | WEEKDAY | 15:00 | 21:00 | 6.0 | 22 | 8 | 14 | 22 |
| 18MAY90 | 5/07-5/20 | WEEKDAY | 7:00 | 13:00 | 6.0 | 11 | 0 | 10 | 10 |
| 18MAY90 | 5/07-5/20 | WEEKDAY | 15:00 | 22:00 | 7.0 | 14 | 6 | 15 | 21 |
| 12MAY90 | 5/07-5/20 | WEEKEND - HOLIDAY | 7:30 | 13:00 | 5.5 | 32 | 11 | 19 | 30 |
| 12MAY90 | 5/07-5/20 | WEEKEND - HOLIDAY | 14:00 | 21:30 | 7.5 | 29 | 5 | 24 | 29 |
| 13MAY90 | 5/07-5/20 | WEEKEND - HOLIDAY | 6:30 | 12:30 | 6.0 | 21 | 6 | 17 | 23 |
| 13MAY90 | 5/07-5/20 | WEEKEND - HOLIDAY | 15:00 | 22:00 | 7.0 | 15 | 0 | 15 | 15 |
| 19MAY90 | 5/07-5/20 | WEEKEND - HOLIDAY | 8:00 | 15:00 | 7.0 | 34 | 3 | 25 | 28 |
| 19MAY90 | 5/07-5/20 | WEEKEND - HOLIDAY | 14:00 | 21:30 | 7.5 | 26 | 2 | 24 | 26 |
| 20MAY90 | 5/07-5/20 | WEEKEND - HOLIDAY | 6:00 | 12:00 | 6.0 | 7 | 0 | 7 | 7 |
| 20MAY90 | 5/07-5/20 | WEEKEND - HOLIDAY | 14:00 | 21:00 | 7.0 | 24 | 7 | 23 | 30 |
| 21MAY90 | 5/21-6/03 | WEEKDAY | 6:00 | 11:15 | 5.2 | 1 | 1 | 0 | 1 |
| 21MAY90 | 5/21-6/03 | WEEKDAY | 15:00 | 21:00 | 6.0 | 21 | 8 | 13 | 21 |
| 24MAY90 | 5/21-6/03 | WEEKDAY | 8:00 | 13:45 | 5.7 | 9 | 0 | 9 | 9 |
| 24MAY90 | 5/21-6/03 | WEEKDAY | 14:15 | 21:15 | 7.0 | 7 | 0 | 7 | 7 |
| 25MAY90 | 5/21-6/03 | WEEKDAY | 7:00 | 13:30 | 6.5 | 12 | 5 | 10 | 15 |
| 25MAY90 | 5/21-6/03 | WEEKDAY | 14:15 | 22:30 | 8.3 | 7 | 5 | 7 | 12 |
| 29MAY90 | 5/21-6/03 | WEEKDAY | 8:00 | 14:15 | 6.2 | 7 | 3 | 5 | 8 |
| 29MAY90 | 5/21-6/03 | WEEKDAY | 15:00 | 21:00 | 6.0 | 9 | 0 | 9 | 9 |
| 30MAY90 | 5/21-6/03 | WEEKDAY | 6:00 | 12:30 | 6.5 | 2 | 0 | 2 | 2 |
| 30MAY90 | 5/21-6/03 | WEEKDAY | 14:15 | 20:15 | 6.0 | 3 | 0 | 3 | 3 |
| 26MAY90 | 5/21-6/03 | WEEKEND - HOLIDAY | 6:00 | 14:15 | 8.3 | 15 | 4 | 15 | 19 |
| 26MAY90 | 5/21-6/03 | WEEKEND - HOLIDAY | 14:00 | 20:30 | 6.5 | 12 | 0 | 12 | 12 |
| 27MAY90 | 5/21-6/03 | WEEKEND - HOLIDAY | 8:00 | 14:45 | 6.7 | 23 | 4 | 21 | 25 |
| 27MAY90 | 5/21-6/03 | WEEKEND - HOLIDAY | 14:15 | 22:30 | 8.3 | 20 | 5 | 20 | 25 |
| 28MAY90 | 5/21-6/03 | WEEKEND - HOLIDAY | 7:00 | 13:30 | 6.5 | 14 | 4 | 10 | 14 |
| 28MAY90 | 5/21-6/03 | WEEKEND - HOLIDAY | 14:30 | 21:30 | 7.0 | 19 | 3 | 19 | 22 |
| 02JUN90 | 5/21-6/03 | WEEKEND - HOLIDAY | 8:00 | 14:30 | 6.5 | 13 | 2 | 11 | 13 |
| 02JUN90 | 5/21-6/03 | WEEKEND - HOLIDAY | 14:15 | 21:45 | 7.5 | 20 | 3 | 19 | 22 |
| 03JUN90 | 5/21-6/03 | WEEKEND - HOLIDAY | 7:00 | 14:00 | 7.0 | 9 | 0 | 9 | 9 |
| 03JUN90 | 5/21-6/03 | WEEKEND - HOLIDAY | 14:15 | 20:15 | 6.0 | 5 | 7 | 2 | 9 |

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Appendix A2. (Page 2 of 7).

| Sample Date | Biweek | Weekday or Weekend/Holiday Stratum | Sampling Period | | Length of Sample Period | Total Number of Anglers Counted | Number of Anglers Interviewed | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Start | End | | | Completed Trips | Uncompleted Trips | Total |
| 04JUN90 | 6/04-6/17 | WEEKDAY | 6:00 | 12:00 | 6.0 | 5 | 0 | 5 | 5 |
| 04JUN90 | 6/04-6/17 | WEEKDAY | 15:00 | 21:30 | 6.5 | 4 | 0 | 4 | 4 |
| 05JUN90 | 6/04-6/17 | WEEKDAY | 7:00 | 12:45 | 5.7 | 1 | 0 | 1 | 1 |
| 05JUN90 | 6/04-6/17 | WEEKDAY | 15:30 | 21:30 | 6.0 | 12 | 0 | 12 | 12 |
| 08JUN90 | 6/04-6/17 | WEEKDAY | 6:00 | 12:45 | 6.7 | 13 | 0 | 13 | 13 |
| 08JUN90 | 6/04-6/17 | WEEKDAY | 14:30 | 21:00 | 6.5 | 6 | 2 | 4 | 6 |
| 11JUN90 | 6/04-6/17 | WEEKDAY | 8:00 | 14:00 | 6.0 | 8 | 1 | 7 | 8 |
| 11JUN90 | 6/04-6/17 | WEEKDAY | 15:00 | 20:30 | 5.5 | 6 | 0 | 6 | 6 |
| 12JUN90 | 6/04-6/17 | WEEKDAY | 8:00 | 15:00 | 7.0 | 20 | 3 | 15 | 18 |
| 12JUN90 | 6/04-6/17 | WEEKDAY | 14:30 | 22:00 | 7.5 | 10 | 0 | 10 | 10 |
| 15JUN90 | 6/04-6/17 | WEEKDAY | 7:00 | 13:30 | 6.5 | 5 | 0 | 5 | 5 |
| 15JUN90 | 6/04-6/17 | WEEKDAY | 15:30 | 21:00 | 5.5 | 5 | 0 | 5 | 5 |
| 09JUN90 | 6/04-6/17 | WEEKEND - HOLIDAY | 7:00 | 13:30 | 6.5 | 8 | 5 | 3 | 8 |
| 09JUN90 | 6/04-6/17 | WEEKEND - HOLIDAY | 14:30 | 21:30 | 7.0 | 5 | 2 | 3 | 5 |
| 10JUN90 | 6/04-6/17 | WEEKEND - HOLIDAY | 7:00 | 14:00 | 7.0 | 19 | 2 | 8 | 10 |
| 10JUN90 | 6/04-6/17 | WEEKEND - HOLIDAY | 14:30 | 22:00 | 7.5 | 28 | 1 | 29 | 30 |
| 16JUN90 | 6/04-6/17 | WEEKEND - HOLIDAY | 6:00 | 12:15 | 6.2 | 11 | 3 | 6 | 9 |
| 16JUN90 | 6/04-6/17 | WEEKEND - HOLIDAY | 15:00 | 22:00 | 7.0 | 0 | 2 | 1 | 3 |
| 17JUN90 | 6/04-6/17 | WEEKEND - HOLIDAY | 7:00 | 13:30 | 6.5 | 9 | 2 | 7 | 9 |
| 17JUN90 | 6/04-6/17 | WEEKEND - HOLIDAY | 14:30 | 21:30 | 7.0 | 13 | 0 | 13 | 13 |
| 18JUN90 | 6/18-7/01 | WEEKDAY | 6:00 | 12:00 | 6.0 | 1 | 0 | 1 | 1 |
| 18JUN90 | 6/18-7/01 | WEEKDAY | 15:30 | 21:30 | 6.0 | 5 | 0 | 5 | 5 |
| 21JUN90 | 6/18-7/01 | WEEKDAY | 7:00 | 13:15 | 6.2 | 10 | 0 | 7 | 7 |
| 21JUN90 | 6/18-7/01 | WEEKDAY | 15:30 | 22:00 | 6.5 | 7 | 0 | 7 | 7 |
| 22JUN90 | 6/18-7/01 | WEEKDAY | 6:00 | 12:15 | 6.2 | 11 | 0 | 11 | 11 |
| 22JUN90 | 6/18-7/01 | WEEKDAY | 14:30 | 21:00 | 6.5 | 1 | 0 | 1 | 1 |
| 27JUN90 | 6/18-7/01 | WEEKDAY | 8:00 | 15:15 | 7.2 | 22 | 0 | 19 | 19 |
| 27JUN90 | 6/18-7/01 | WEEKDAY | 15:00 | 21:30 | 6.5 | 25 | 4 | 21 | 25 |
| 28JUN90 | 6/18-7/01 | WEEKDAY | 6:00 | 12:00 | 6.0 | 7 | 0 | 7 | 7 |
| 28JUN90 | 6/18-7/01 | WEEKDAY | 14:30 | 20:30 | 6.0 | 19 | 0 | 19 | 19 |
| 29JUN90 | 6/18-7/01 | WEEKDAY | 7:00 | 14:00 | 7.0 | 22 | 1 | 21 | 22 |
| 29JUN90 | 6/18-7/01 | WEEKDAY | 14:00 | 21:00 | 7.0 | 38 | 9 | 29 | 38 |
| 23JUN90 | 6/18-7/01 | WEEKEND - HOLIDAY | 6:00 | 13:15 | 7.2 | 24 | 4 | 13 | 17 |
| 23JUN90 | 6/18-7/01 | WEEKEND - HOLIDAY | 14:30 | 21:30 | 7.0 | 8 | 0 | 8 | 8 |
| 24JUN90 | 6/18-7/01 | WEEKEND - HOLIDAY | 8:00 | 15:30 | 7.5 | 31 | 8 | 22 | 30 |
| 24JUN90 | 6/18-7/01 | WEEKEND - HOLIDAY | 14:30 | 22:00 | 7.5 | 14 | 5 | 9 | 14 |
| 30JUN90 | 6/18-7/01 | WEEKEND - HOLIDAY | 7:00 | 13:15 | 6.2 | 18 | 0 | 16 | 16 |
| 30JUN90 | 6/18-7/01 | WEEKEND - HOLIDAY | 14:30 | 22:00 | 7.5 | 13 | 13 | 12 | 25 |

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Appendix A2. (Page 3 of 7).

| Sample Date | Biweek | Weekday or Weekend/Holiday Stratum | Sampling Period | | Length of Sample Period | Total Number of Anglers Counted | Number of Anglers Interviewed | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Start | End | | | Completed Trips | Uncompleted Trips | Total |
| 01JUL90 | 6/18-7/01 | WEEKEND - HOLIDAY | 6:00 | 12:30 | 6.5 | 21 | 1 | 14 | 15 |
| 01JUL90 | 6/18-7/01 | WEEKEND - HOLIDAY | 14:30 | 21:30 | 7.0 | 28 | 10 | 25 | 35 |
| 02JUL90 | 7/02-7/15 | WEEKDAY | 8:00 | 15:00 | 7.0 | 17 | 4 | 13 | 17 |
| 02JUL90 | 7/02-7/15 | WEEKDAY | 15:30 | 21:30 | 6.0 | 16 | 2 | 15 | 17 |
| 03JUL90 | 7/02-7/15 | WEEKDAY | 7:00 | 13:30 | 6.5 | 24 | 0 | 18 | 18 |
| 03JUL90 | 7/02-7/15 | WEEKDAY | 15:00 | 21:30 | 6.5 | 20 | 9 | 19 | 28 |
| 11JUL90 | 7/02-7/15 | WEEKDAY | 7:00 | 14:45 | 7.7 | 34 | 3 | 26 | 29 |
| 11JUL90 | 7/02-7/15 | WEEKDAY | 14:30 | 21:00 | 6.5 | 29 | 7 | 25 | 32 |
| 12JUL90 | 7/02-7/15 | WEEKDAY | 8:00 | 13:45 | 5.7 | 6 | 0 | 6 | 6 |
| 12JUL90 | 7/02-7/15 | WEEKDAY | 15:00 | 21:00 | 6.0 | 16 | 2 | 14 | 16 |
| 13JUL90 | 7/02-7/15 | WEEKDAY | 8:00 | 14:30 | 6.5 | 33 | 0 | 19 | 19 |
| 13JUL90 | 7/02-7/15 | WEEKDAY | 14:30 | 22:00 | 7.5 | 27 | 22 | 26 | 48 |
| 04JUL90 | 7/02-7/15 | WEEKEND - HOLIDAY | 6:00 | 11:30 | 5.5 | 6 | 1 | 5 | 6 |
| 07JUL90 | 7/02-7/15 | WEEKEND - HOLIDAY | 7:00 | 14:00 | 7.0 | 29 | 10 | 19 | 29 |
| 07JUL90 | 7/02-7/15 | WEEKEND - HOLIDAY | 14:30 | 22:00 | 7.5 | 17 | 10 | 13 | 23 |
| 08JUL90 | 7/02-7/15 | WEEKEND - HOLIDAY | 7:00 | 13:30 | 6.5 | 19 | 2 | 17 | 19 |
| 08JUL90 | 7/02-7/15 | WEEKEND - HOLIDAY | 14:30 | 21:30 | 7.0 | 42 | 4 | 37 | 41 |
| 14JUL90 | 7/02-7/15 | WEEKEND - HOLIDAY | 6:00 | 13:30 | 7.5 | 38 | 8 | 29 | 37 |
| 14JUL90 | 7/02-7/15 | WEEKEND - HOLIDAY | 14:30 | 21:30 | 7.0 | 18 | 18 | 18 | 36 |
| 15JUL90 | 7/02-7/15 | WEEKEND - HOLIDAY | 8:00 | 14:45 | 6.7 | 51 | 9 | 33 | 42 |
| 15JUL90 | 7/02-7/15 | WEEKEND - HOLIDAY | 14:30 | 22:00 | 7.5 | 43 | 7 | 36 | 43 |
| 16JUL90 | 7/16-7/29 | WEEKDAY | 7:00 | 14:15 | 7.2 | 28 | 3 | 25 | 28 |
| 16JUL90 | 7/16-7/29 | WEEKDAY | 14:15 | 21:15 | 7.0 | 70 | 9 | 64 | 73 |
| 17JUL90 | 7/16-7/29 | WEEKDAY | 6:00 | 12:00 | 6.0 | 28 | 2 | 21 | 23 |
| 17JUL90 | 7/16-7/29 | WEEKDAY | 14:30 | 21:00 | 6.5 | 47 | 6 | 37 | 43 |
| 18JUL90 | 7/16-7/29 | WEEKDAY | 7:00 | 13:30 | 6.5 | 29 | 5 | 17 | 22 |
| 18JUL90 | 7/16-7/29 | WEEKDAY | 14:30 | 22:00 | 7.5 | 63 | 6 | 62 | 68 |
| 23JUL90 | 7/16-7/29 | WEEKDAY | 7:00 | 13:00 | 6.0 | 11 | 9 | 11 | 20 |
| 23JUL90 | 7/16-7/29 | WEEKDAY | 14:30 | 21:00 | 6.5 | 48 | 6 | 40 | 46 |
| 26JUL90 | 7/16-7/29 | WEEKDAY | 8:00 | 14:15 | 6.2 | 22 | 8 | 18 | 26 |
| 26JUL90 | 7/16-7/29 | WEEKDAY | 14:30 | 21:30 | 7.0 | 31 | 3 | 31 | 34 |
| 27JUL90 | 7/16-7/29 | WEEKDAY | 6:00 | 13:00 | 7.0 | 23 | 1 | 22 | 23 |
| 27JUL90 | 7/16-7/29 | WEEKDAY | 14:30 | 21:30 | 7.0 | 46 | 1 | 46 | 47 |
| 21JUL90 | 7/16-7/29 | WEEKEND - HOLIDAY | 14:30 | 22:00 | 7.5 | 53 | 6 | 47 | 53 |
| 22JUL90 | 7/16-7/29 | WEEKEND - HOLIDAY | 8:00 | 14:15 | 6.2 | 26 | 4 | 21 | 25 |
| 22JUL90 | 7/16-7/29 | WEEKEND - HOLIDAY | 14:30 | 21:30 | 7.0 | 41 | 4 | 30 | 34 |
| 28JUL90 | 7/16-7/29 | WEEKEND - HOLIDAY | 6:00 | 12:45 | 6.7 | 35 | 4 | 28 | 32 |
| 28JUL90 | 7/16-7/29 | WEEKEND - HOLIDAY | 14:30 | 22:00 | 7.5 | 59 | 4 | 58 | 62 |

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Appendix A2. (Page 4 of 7).

| Sample Date | Biweek | Weekday or Weekend/Holiday Stratum | Sampling Period | | Length of Sample Period | Total Number of Anglers Counted | Number of Anglers Interviewed | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Start | End | | | Completed Trips | Uncompleted Trips | Total |
| 29JUL90 | 7/16-7/29 | WEEKEND - HOLIDAY | 8:00 | 14:30 | 6.5 | 31 | 3 | 28 | 31 |
| 29JUL90 | 7/16-7/29 | WEEKEND - HOLIDAY | 14:30 | 22:00 | 7.5 | 59 | 4 | 59 | 63 |
| 30JUL90 | 7/30-8/12 | WEEKDAY | 8:00 | 15:00 | 7.0 | 25 | 1 | 24 | 25 |
| 30JUL90 | 7/30-8/12 | WEEKDAY | 15:00 | 21:00 | 6.0 | 23 | 0 | 22 | 22 |
| 02AUG90 | 7/30-8/12 | WEEKDAY | 6:00 | 12:30 | 6.5 | 4 | 1 | 2 | 3 |
| 02AUG90 | 7/30-8/12 | WEEKDAY | 15:00 | 21:30 | 6.5 | 24 | 0 | 22 | 22 |
| 06AUG90 | 7/30-8/12 | WEEKDAY | 15:00 | 21:30 | 6.5 | 32 | 6 | 26 | 32 |
| 07AUG90 | 7/30-8/12 | WEEKDAY | 7:00 | 14:30 | 7.5 | 51 | 5 | 46 | 51 |
| 10AUG90 | 7/30-8/12 | WEEKDAY | 8:00 | 16:00 | 8.0 | 44 | 3 | 41 | 44 |
| 10AUG90 | 7/30-8/12 | WEEKDAY | 14:00 | 21:00 | 7.0 | 26 | 5 | 25 | 30 |
| 04AUG90 | 7/30-8/12 | WEEKEND - HOLIDAY | 7:00 | 14:00 | 7.0 | 25 | 0 | 25 | 25 |
| 11AUG90 | 7/30-8/12 | WEEKEND - HOLIDAY | 8:00 | 15:15 | 7.2 | 44 | 10 | 33 | 43 |
| 11AUG90 | 7/30-8/12 | WEEKEND - HOLIDAY | 14:00 | 21:00 | 7.0 | 43 | 12 | 35 | 47 |
| 12AUG90 | 7/30-8/12 | WEEKEND - HOLIDAY | 6:00 | 12:15 | 6.2 | 12 | 2 | 10 | 12 |
| 12AUG90 | 7/30-8/12 | WEEKEND - HOLIDAY | 14:00 | 21:00 | 7.0 | 35 | 3 | 33 | 36 |
| 13AUG90 | 8/13-8/26 | WEEKDAY | 8:00 | 14:45 | 6.7 | 23 | 4 | 18 | 22 |
| 13AUG90 | 8/13-8/26 | WEEKDAY | 14:00 | 20:30 | 6.5 | 15 | 1 | 13 | 14 |
| 14AUG90 | 8/13-8/26 | WEEKDAY | 7:00 | 13:30 | 6.5 | 7 | 5 | 7 | 12 |
| 14AUG90 | 8/13-8/26 | WEEKDAY | 14:00 | 21:00 | 7.0 | 28 | 11 | 27 | 38 |
| 15AUG90 | 8/13-8/26 | WEEKDAY | 14:00 | 21:00 | 7.0 | 23 | 2 | 21 | 23 |
| 17AUG90 | 8/13-8/26 | WEEKDAY | 7:00 | 13:30 | 6.5 | 19 | 1 | 18 | 19 |
| 20AUG90 | 8/13-8/26 | WEEKDAY | 7:00 | 13:15 | 6.2 | 12 | 0 | 12 | 12 |
| 20AUG90 | 8/13-8/26 | WEEKDAY | 13:45 | 19:45 | 6.0 | 26 | 9 | 20 | 29 |
| 23AUG90 | 8/13-8/26 | WEEKDAY | 7:00 | 12:15 | 5.2 | 12 | 3 | 7 | 10 |
| 23AUG90 | 8/13-8/26 | WEEKDAY | 14:30 | 20:00 | 5.5 | 17 | 0 | 17 | 17 |
| 24AUG90 | 8/13-8/26 | WEEKDAY | 8:00 | 14:45 | 6.7 | 29 | 5 | 28 | 33 |
| 24AUG90 | 8/13-8/26 | WEEKDAY | 14:00 | 20:00 | 6.0 | 23 | 3 | 20 | 23 |
| 18AUG90 | 8/13-8/26 | WEEKEND - HOLIDAY | 6:00 | 12:00 | 6.0 | 12 | 2 | 10 | 12 |
| 18AUG90 | 8/13-8/26 | WEEKEND - HOLIDAY | 13:45 | 20:30 | 6.7 | 37 | 8 | 31 | 39 |
| 19AUG90 | 8/13-8/26 | WEEKEND - HOLIDAY | 6:00 | 12:15 | 6.2 | 3 | 0 | 3 | 3 |
| 19AUG90 | 8/13-8/26 | WEEKEND - HOLIDAY | 14:00 | 19:00 | 5.0 | 15 | 3 | 14 | 17 |
| 25AUG90 | 8/13-8/26 | WEEKEND - HOLIDAY | 8:00 | 14:00 | 6.0 | 26 | 2 | 16 | 18 |
| 25AUG90 | 8/13-8/26 | WEEKEND - HOLIDAY | 13:45 | 20:45 | 7.0 | 55 | 8 | 46 | 54 |
| 26AUG90 | 8/13-8/26 | WEEKEND - HOLIDAY | 7:00 | 14:45 | 7.7 | 53 | 6 | 36 | 42 |
| 26AUG90 | 8/13-8/26 | WEEKEND - HOLIDAY | 13:45 | 20:45 | 7.0 | 20 | 5 | 21 | 26 |
| 27AUG90 | 8/27-9/09 | WEEKDAY | 8:30 | 15:15 | 6.7 | 15 | 1 | 11 | 12 |
| 27AUG90 | 8/27-9/09 | WEEKDAY | 14:00 | 19:30 | 5.5 | 10 | 5 | 9 | 14 |

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Appendix A2. (Page 5 of 7).

| Sample Date | Biweek | Weekday or Weekend/Holiday Stratum | Sampling Period | | Length of Sample Period | Total Number of Anglers Counted | Number of Anglers Interviewed | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Start | End | | | Completed Trips | Uncompleted Trips | Total |
| 28AUG90 | 8/27-9/09 | WEEKDAY | 7:30 | 14:00 | 6.5 | 10 | 3 | 7 | 10 |
| 28AUG90 | 8/27-9/09 | WEEKDAY | 13:30 | 20:00 | 6.5 | 34 | 1 | 34 | 35 |
| 29AUG90 | 8/27-9/09 | WEEKDAY | 7:30 | 13:30 | 6.0 | 8 | 0 | 8 | 8 |
| 29AUG90 | 8/27-9/09 | WEEKDAY | 13:30 | 19:30 | 6.0 | 24 | 3 | 22 | 25 |
| 04SEP90 | 8/27-9/09 | WEEKDAY | 14:00 | 20:00 | 6.0 | 11 | 1 | 5 | 6 |
| 05SEP90 | 8/27-9/09 | WEEKDAY | 7:30 | 12:15 | 4.7 | 2 | 0 | 2 | 2 |
| 05SEP90 | 8/27-9/09 | WEEKDAY | 14:00 | 20:00 | 6.0 | 14 | 0 | 13 | 13 |
| 06SEP90 | 8/27-9/09 | WEEKDAY | 7:30 | 15:00 | 7.5 | 6 | 2 | 4 | 6 |
| 01SEP90 | 8/27-9/09 | WEEKEND - HOLIDAY | 8:30 | 14:15 | 5.7 | 15 | 1 | 9 | 10 |
| 01SEP90 | 8/27-9/09 | WEEKEND - HOLIDAY | 14:30 | 20:00 | 5.5 | 22 | 2 | 16 | 18 |
| 02SEP90 | 8/27-9/09 | WEEKEND - HOLIDAY | 7:30 | 14:00 | 6.5 | 14 | 0 | 7 | 7 |
| 02SEP90 | 8/27-9/09 | WEEKEND - HOLIDAY | 13:30 | 20:30 | 7.0 | 16 | 0 | 10 | 10 |
| 03SEP90 | 8/27-9/09 | WEEKEND - HOLIDAY | 6:30 | 13:30 | 7.0 | 26 | 1 | 25 | 26 |
| 03SEP90 | 8/27-9/09 | WEEKEND - HOLIDAY | 13:30 | 19:00 | 5.5 | 11 | 6 | 9 | 15 |
| 08SEP90 | 8/27-9/09 | WEEKEND - HOLIDAY | 6:40 | 12:45 | 6.1 | 24 | 13 | 17 | 30 |
| 08SEP90 | 8/27-9/09 | WEEKEND - HOLIDAY | 13:30 | 20:30 | 7.0 | 32 | 6 | 28 | 34 |
| 09SEP90 | 8/27-9/09 | WEEKEND - HOLIDAY | 6:30 | 12:45 | 6.2 | 26 | 13 | 16 | 29 |
| 09SEP90 | 8/27-9/09 | WEEKEND - HOLIDAY | 13:30 | 20:30 | 7.0 | 20 | 14 | 20 | 34 |
| 10SEP90 | 9/10-9/23 | WEEKDAY | 14:00 | 20:00 | 6.0 | 12 | 4 | 8 | 12 |
| 12SEP90 | 9/10-9/23 | WEEKDAY | 8:00 | 13:00 | 5.0 | 10 | 3 | 6 | 9 |
| 13SEP90 | 9/10-9/23 | WEEKDAY | 8:00 | 14:45 | 6.7 | 20 | 4 | 15 | 19 |
| 13SEP90 | 9/10-9/23 | WEEKDAY | 13:30 | 19:30 | 6.0 | 33 | 8 | 22 | 30 |
| 14SEP90 | 9/10-9/23 | WEEKDAY | 8:00 | 15:00 | 7.0 | 19 | 1 | 13 | 14 |
| 14SEP90 | 9/10-9/23 | WEEKDAY | 13:30 | 20:00 | 6.5 | 9 | 6 | 4 | 10 |
| 17SEP90 | 9/10-9/23 | WEEKDAY | 8:00 | 14:30 | 6.5 | 14 | 3 | 13 | 16 |
| 17SEP90 | 9/10-9/23 | WEEKDAY | 13:30 | 18:30 | 5.0 | 16 | 3 | 13 | 16 |
| 20SEP90 | 9/10-9/23 | WEEKDAY | 7:00 | 13:00 | 6.0 | 11 | 0 | 8 | 8 |
| 20SEP90 | 9/10-9/23 | WEEKDAY | 13:30 | 19:30 | 6.0 | 20 | 3 | 20 | 23 |
| 21SEP90 | 9/10-9/23 | WEEKDAY | 7:00 | 13:30 | 6.5 | 7 | 0 | 6 | 6 |
| 21SEP90 | 9/10-9/23 | WEEKDAY | 13:30 | 19:00 | 5.5 | 10 | 1 | 8 | 9 |
| 15SEP90 | 9/10-9/23 | WEEKEND - HOLIDAY | 7:00 | 15:30 | 8.5 | 20 | 6 | 16 | 22 |
| 15SEP90 | 9/10-9/23 | WEEKEND - HOLIDAY | 13:30 | 20:30 | 7.0 | 30 | 13 | 28 | 41 |
| 16SEP90 | 9/10-9/23 | WEEKEND - HOLIDAY | 7:00 | 15:30 | 8.5 | 39 | 5 | 33 | 38 |
| 16SEP90 | 9/10-9/23 | WEEKEND - HOLIDAY | 13:30 | 20:30 | 7.0 | 50 | 15 | 40 | 55 |
| 22SEP90 | 9/10-9/23 | WEEKEND - HOLIDAY | 7:00 | 13:00 | 6.0 | 23 | 3 | 23 | 26 |
| 22SEP90 | 9/10-9/23 | WEEKEND - HOLIDAY | 13:30 | 19:30 | 6.0 | 18 | 3 | 16 | 19 |
| 23SEP90 | 9/10-9/23 | WEEKEND - HOLIDAY | 7:45 | 12:00 | 4.2 | 8 | 3 | 7 | 10 |
| 23SEP90 | 9/10-9/23 | WEEKEND - HOLIDAY | 13:30 | 19:00 | 5.5 | 12 | 1 | 9 | 10 |

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Appendix A2. (Page 6 of 7).

| Sample Date | Biweek | Weekday or Weekend/Holiday Stratum | Sampling Period | | Length of Sample Period | Total Number of Anglers Counted | Number of Anglers Interviewed | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Start | End | | | Completed Trips | Uncompleted Trips | Total |
| 24SEP90 | 9/24-10/07 | WEEKDAY | 13:15 | 19:15 | 6.0 | 8 | 2 | 8 | 10 |
| 25SEP90 | 9/24-10/07 | WEEKDAY | 7:30 | 14:15 | 6.7 | 23 | 2 | 29 | 31 |
| 25SEP90 | 9/24-10/07 | WEEKDAY | 13:15 | 19:15 | 6.0 | 20 | 0 | 20 | 20 |
| 26SEP90 | 9/24-10/07 | WEEKDAY | 7:30 | 13:30 | 6.0 | 9 | 2 | 7 | 9 |
| 26SEP90 | 9/24-10/07 | WEEKDAY | 13:15 | 19:15 | 6.0 | 14 | 4 | 14 | 18 |
| 28SEP90 | 9/24-10/07 | WEEKDAY | 7:30 | 11:30 | 4.0 | 2 | 0 | 2 | 2 |
| 01OCT90 | 9/24-10/07 | WEEKDAY | 7:30 | 13:00 | 5.5 | 13 | 1 | 9 | 10 |
| 01OCT90 | 9/24-10/07 | WEEKDAY | 13:00 | 18:45 | 5.7 | 18 | 4 | 13 | 17 |
| 04OCT90 | 9/24-10/07 | WEEKDAY | 7:30 | 12:30 | 5.0 | 6 | 3 | 4 | 7 |
| 04OCT90 | 9/24-10/07 | WEEKDAY | 13:15 | 19:00 | 5.7 | 8 | 0 | 8 | 8 |
| 05OCT90 | 9/24-10/07 | WEEKDAY | 7:30 | 12:30 | 5.0 | 11 | 2 | 11 | 13 |
| 05OCT90 | 9/24-10/07 | WEEKDAY | 13:15 | 16:30 | 3.2 | 1 | 2 | 1 | 3 |
| 29SEP90 | 9/24-10/07 | WEEKEND - HOLIDAY | 7:30 | 13:30 | 6.0 | 12 | 6 | 9 | 15 |
| 29SEP90 | 9/24-10/07 | WEEKEND - HOLIDAY | 13:15 | 18:15 | 5.0 | 10 | 1 | 9 | 10 |
| 30SEP90 | 9/24-10/07 | WEEKEND - HOLIDAY | 7:30 | 12:45 | 5.2 | 18 | 3 | 15 | 18 |
| 30SEP90 | 9/24-10/07 | WEEKEND - HOLIDAY | 13:15 | 18:00 | 4.7 | 25 | 5 | 21 | 26 |
| 06OCT90 | 9/24-10/07 | WEEKEND - HOLIDAY | 7:30 | 11:45 | 4.2 | 4 | 0 | 4 | 4 |
| 06OCT90 | 9/24-10/07 | WEEKEND - HOLIDAY | 13:15 | 18:00 | 4.7 | 3 | 2 | 2 | 4 |
| 07OCT90 | 9/24-10/07 | WEEKEND - HOLIDAY | 7:30 | 13:30 | 6.0 | 22 | 2 | 16 | 18 |
| 07OCT90 | 9/24-10/07 | WEEKEND - HOLIDAY | 15:15 | 17:15 | 2.0 | 5 | 3 | 1 | 4 |
| 09OCT90 | 10/08-10/21 | WEEKDAY | 8:30 | 11:15 | 2.7 | 3 | 0 | 3 | 3 |
| 09OCT90 | 10/08-10/21 | WEEKDAY | 13:15 | 17:30 | 4.2 | 13 | 0 | 12 | 12 |
| 10OCT90 | 10/08-10/21 | WEEKDAY | 13:15 | 17:30 | 4.2 | 7 | 0 | 7 | 7 |
| 12OCT90 | 10/08-10/21 | WEEKDAY | 8:15 | 11:00 | 2.7 | 0 | 0 | 0 | 0 |
| 15OCT90 | 10/08-10/21 | WEEKDAY | 8:00 | 11:45 | 3.7 | 1 | 0 | 1 | 1 |
| 15OCT90 | 10/08-10/21 | WEEKDAY | 13:15 | 17:15 | 4.0 | 0 | 0 | 0 | 0 |
| 16OCT90 | 10/08-10/21 | WEEKDAY | 9:30 | 13:00 | 3.5 | 3 | 0 | 3 | 3 |
| 16OCT90 | 10/08-10/21 | WEEKDAY | 13:30 | 17:30 | 4.0 | 0 | 0 | 0 | 0 |
| 19OCT90 | 10/08-10/21 | WEEKDAY | 8:00 | 11:30 | 3.5 | 0 | 0 | 0 | 0 |
| 19OCT90 | 10/08-10/21 | WEEKDAY | 14:00 | 16:30 | 2.5 | 2 | 0 | 2 | 2 |
| 08OCT90 | 10/08-10/21 | WEEKEND - HOLIDAY | 8:00 | 11:00 | 3.0 | 6 | 0 | 5 | 5 |
| 08OCT90 | 10/08-10/21 | WEEKEND - HOLIDAY | 13:45 | 18:30 | 4.7 | 7 | 3 | 6 | 9 |
| 13OCT90 | 10/08-10/21 | WEEKEND - HOLIDAY | 8:00 | 12:00 | 4.0 | 2 | 1 | 1 | 2 |
| 13OCT90 | 10/08-10/21 | WEEKEND - HOLIDAY | 13:30 | 17:30 | 4.0 | 1 | 0 | 1 | 1 |
| 14OCT90 | 10/08-10/21 | WEEKEND - HOLIDAY | 8:00 | 13:00 | 5.0 | 16 | 4 | 15 | 19 |
| 14OCT90 | 10/08-10/21 | WEEKEND - HOLIDAY | 13:30 | 18:30 | 5.0 | 11 | 5 | 11 | 16 |
| 20OCT90 | 10/08-10/21 | WEEKEND - HOLIDAY | 8:00 | 11:30 | 3.5 | 3 | 0 | 3 | 3 |
| 20OCT90 | 10/08-10/21 | WEEKEND - HOLIDAY | 13:30 | 17:30 | 4.0 | 2 | 2 | 2 | 4 |

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Appendix A2. (Page 7 of 7).

| Sample Date | Biweek | Weekday or Weekend/Holiday Stratum | Sampling Period | | Length of Sample Period | Total Number of Anglers Counted | Number of Anglers Interviewed | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Start | End | | | Completed Trips | Uncompleted Trips | Total |
| 21OCT90 | 10/08-10/21 | WEEKEND - HOLIDAY | 8:00 | 12:00 | 4.0 | 4 | 0 | 4 | 4 |
| 21OCT90 | 10/08-10/21 | WEEKEND - HOLIDAY | 13:30 | 17:30 | 4.0 | 7 | 3 | 3 | 6 |
| 22OCT90 | 10/22-11/04 | WEEKDAY | 9:00 | 11:00 | 2.0 | 0 | 0 | 0 | 0 |
| 22OCT90 | 10/22-11/04 | WEEKDAY | 14:00 | 16:00 | 2.0 | 0 | 0 | 0 | 0 |
| 23OCT90 | 10/22-11/04 | WEEKDAY | 8:00 | 10:00 | 2.0 | 0 | 0 | 0 | 0 |
| 23OCT90 | 10/22-11/04 | WEEKDAY | 14:00 | 16:00 | 2.0 | 0 | 0 | 0 | 0 |
| 26OCT90 | 10/22-11/04 | WEEKDAY | 8:00 | 10:00 | 2.0 | 0 | 0 | 0 | 0 |
| 26OCT90 | 10/22-11/04 | WEEKDAY | 15:00 | 16:30 | 1.5 | 2 | 0 | 1 | 1 |
| 29OCT90 | 10/22-11/04 | WEEKDAY | 8:00 | 10:00 | 2.0 | 0 | 0 | 0 | 0 |
| 29OCT90 | 10/22-11/04 | WEEKDAY | 15:00 | 17:00 | 2.0 | 0 | 0 | 0 | 0 |
| 30OCT90 | 10/22-11/04 | WEEKDAY | 9:00 | 11:00 | 2.0 | 5 | 0 | 3 | 3 |
| 30OCT90 | 10/22-11/04 | WEEKDAY | 14:15 | 16:00 | 1.8 | 0 | 0 | 0 | 0 |
| 02NOV90 | 10/22-11/04 | WEEKDAY | 10:00 | 12:00 | 2.0 | 0 | 0 | 0 | 0 |
| 02NOV90 | 10/22-11/04 | WEEKDAY | 13:00 | 14:00 | 1.0 | 0 | 0 | 0 | 0 |
| 27OCT90 | 10/22-11/04 | WEEKEND - HOLIDAY | 8:30 | 11:00 | 2.5 | 1 | 0 | 1 | 1 |
| 27OCT90 | 10/22-11/04 | WEEKEND - HOLIDAY | 13:00 | 15:00 | 2.0 | 3 | 0 | 3 | 3 |
| 28OCT90 | 10/22-11/04 | WEEKEND - HOLIDAY | 9:30 | 11:00 | 1.5 | 0 | 0 | 0 | 0 |
| 28OCT90 | 10/22-11/04 | WEEKEND - HOLIDAY | 14:00 | 16:00 | 2.0 | 3 | 0 | 3 | 3 |
| 03NOV90 | 10/22-11/04 | WEEKEND - HOLIDAY | 13:30 | 15:30 | 2.0 | 0 | 0 | 0 | 0 |
| 04NOV90 | 10/22-11/04 | WEEKEND - HOLIDAY | 13:15 | 15:00 | 1.8 | 0 | 0 | 0 | 0 |

Appendix A3. Major computer files used for data analysis of 1990 Juneau roadside harvest data.

| File | Description |
|---|---|
| Data files: | |
| c90jrs.dta | Raw mark-sense interview data files |
| dv90jrs.dta | Dolly Varden length data |
| jrs90.sas | SAS code to input interview data to a SAS dataset |
| jrs90msa.ssd | SAS dataset with raw data in it |
| jrs90msa.lst | Listing of sampling information |
| Harvest estimate analysis: | |
| jrs90ess.sas | Preliminary harvest estimate program to ready data for jrs90est.sas |
| jrs90ess.ssd | SAS dataset formed by jrs90ess.sas |
| jrs90__e.dat | Input data to jrs90est.sas (one for each species - KS, KI, SS, etc.) |
| jrs90est.sas | Harvest estimate program - uses 2 files above |
| jrs90__e.lst | Listing of harvest estimates for each species from program above |
| Hatchery contribution analysis: | |
| Sportbas.dta | Individual listings of tag recoveries |
| Sportcon.dta | Individual listings of sampling information |
| jrw90vbn.sas | Formats data files for hatchery contribution estimates. |
| jrw90vbn.lst | Listing of harvest estimates, number of fish sampled, and variances by sampling strata. |
| jrw90vbn.ssd | SAS data set of above data. |
| jrn90cwt.sas | Calculates hatchery contributions using sport.con, sport.bas, and jrw90vbn.ssd |
| jrn90cwt.ssd | SAS dataset formed by jrn90cwt.sas |
| jrn90cwt.lst | Listing of hatchery contributions by tagging recoveries |
| jrn90cwp.doc | Listing of hatchery contribution estimates by species and site. |
| Dolly Varden length frequency analysis: | |
| lf90dvr_.sas, log, lst | SAS analysis and output of length data |

Appendix A4. Effort and harvest statistics for the saltwater beaches located on the north end (Lynn Canal area) of the Juneau roadside by biweekly period and area during 1990.

| | | | Biweekly Period | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 5/07-5/20 | 5/21-6/03 | 6/04-6/17 | 6/18-7/01 | 7/02-7/15 | 7/16-7/29 | 7/30-8/12 | 8/13-8/26 | 8/27-9/09 | 9/10-9/23 | 9/24-10/07 | Total |
| Echo Cove | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | 96 | 73 | 221 | 198 | 389 | 327 | | | | | | 1,304 |
| | | Variance | 3,656 | 2,194 | 14,450 | 6,535 | 16,185 | 17,159 | | | | | | 60,179 |
| Pink salmon | Catch | Estimate | 0 | 0 | 0 | 56 | 268 | 82 | | | | | | 406 |
| | | Variance | 0 | 0 | 0 | 1,649 | 12,223 | 23,092 | | | | | | 36,964 |
| | Harvest | Estimate | 0 | 0 | 0 | 56 | 222 | 82 | | | | | | 360 |
| | | Variance | 0 | 0 | 0 | 1,649 | 10,741 | 23,092 | | | | | | 35,482 |
| Dolly Varden | Catch | Estimate | 114 | 3 | 408 | 48 | 17 | 17 | | | | | | 607 |
| | | Variance | 8,429 | 13 | 61,027 | 1,318 | 157 | 191 | | | | | | 71,135 |
| | Harvest | Estimate | 98 | 3 | 400 | 41 | 14 | 0 | | | | | | 556 |
| | | Variance | 7,382 | 13 | 59,932 | 914 | 103 | 0 | | | | | | 68,344 |
| North Bridget Cove | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | 0 | 15 | 0 | 0 | 0 | 14 | | | | | | 29 |
| | | Variance | 0 | 221 | 0 | 0 | 0 | 189 | | | | | | 410 |
| Large chinook salmon (>28") | Catch | Estimate | 0 | 4 | 0 | 0 | 0 | 0 | | | | | | 4 |
| | | Variance | 0 | 14 | 0 | 0 | 0 | 0 | | | | | | 14 |
| | Harvest | Estimate | 0 | 4 | 0 | 0 | 0 | 0 | | | | | | 4 |
| | | Variance | 0 | 14 | 0 | 0 | 0 | 0 | | | | | | 14 |
| Pink salmon | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 18 | | | | | | 18 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 336 | | | | | | 336 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 18 | | | | | | 18 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 336 | | | | | | 336 |
| Cutthroat Trout | Catch | Estimate | 0 | 4 | 0 | 0 | 0 | 0 | | | | | | 4 |
| | | Variance | 0 | 14 | 0 | 0 | 0 | 0 | | | | | | 14 |
| | Harvest | Estimate | 0 | 4 | 0 | 0 | 0 | 0 | | | | | | 4 |
| | | Variance | 0 | 14 | 0 | 0 | 0 | 0 | | | | | | 14 |
| South Bridget Cove | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | 0 | 46 | 0 | 0 | 0 | 0 | | | | | | 46 |
| | | Variance | 0 | 1,154 | 0 | 0 | 0 | 0 | | | | | | 1,154 |
| Sunshine Cove | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | 40 | 41 | 43 | 79 | 58 | 28 | | | | | | 289 |
| | | Variance | 904 | 340 | 1,806 | 1,814 | 1,702 | 348 | | | | | | 6,914 |
| Dolly Varden | Catch | Estimate | 16 | 10 | 65 | 17 | 31 | 0 | | | | | | 139 |
| | | Variance | 256 | 169 | 4,258 | 157 | 936 | 0 | | | | | | 5,776 |
| | Harvest | Estimate | 8 | 10 | 29 | 17 | 0 | 0 | | | | | | 64 |
| | | Variance | 64 | 169 | 851 | 157 | 0 | 0 | | | | | | 1,241 |

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| | | | Biweekly Period | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 5/07-5/20 | 5/21-6/03 | 6/04-6/17 | 6/18-7/01 | 7/02-7/15 | 7/16-7/29 | 7/30-8/12 | 8/13-8/26 | 8/27-9/09 | 9/10-9/23 | 9/24-10/07 | Total |
| **Sunrise Beach** | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | 72 | 58 | 62 | 28 | 9 | 58 | | | | | | 287 |
| | | Variance | 2,144 | 1,702 | 1,525 | 803 | 113 | 1,089 | | | | | | 7,376 |
| Small chinook salmon (<28") | Catch | Estimate | 0 | 0 | 7 | 0 | 0 | 0 | | | | | | 7 |
| | | Variance | 0 | 0 | 50 | 0 | 0 | 0 | | | | | | 50 |
| | Harvest | Estimate | 0 | 0 | 7 | 0 | 0 | 0 | | | | | | 7 |
| | | Variance | 0 | 0 | 50 | 0 | 0 | 0 | | | | | | 50 |
| Dolly Varden | Catch | Estimate | 75 | 57 | 40 | 0 | 0 | 39 | | | | | | 211 |
| | | Variance | 3,224 | 2,209 | 910 | 0 | 0 | 1,039 | | | | | | 7,382 |
| | Harvest | Estimate | 75 | 18 | 7 | 0 | 0 | 0 | | | | | | 100 |
| | | Variance | 3,224 | 195 | 50 | 0 | 0 | 0 | | | | | | 3,469 |
| Cutthroat Trout | Catch | Estimate | 5 | 0 | 0 | 0 | 0 | 0 | | | | | | 5 |
| | | Variance | 20 | 0 | 0 | 0 | 0 | 0 | | | | | | 20 |
| | Harvest | Estimate | 5 | 0 | 0 | 0 | 0 | 0 | | | | | | 5 |
| | | Variance | 20 | 0 | 0 | 0 | 0 | 0 | | | | | | 20 |
| **End of Road Bluffs** | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | 16 | 58 | 28 | 34 | 17 | 0 | | | | | | 153 |
| | | Variance | 256 | 1,157 | 803 | 578 | 452 | 0 | | | | | | 3,246 |
| Dolly Varden | Catch | Estimate | 0 | 39 | 0 | 3 | 0 | 0 | | | | | | 42 |
| | | Variance | 0 | 630 | 0 | 9 | 0 | 0 | | | | | | 639 |
| | Harvest | Estimate | 0 | 13 | 0 | 3 | 0 | 0 | | | | | | 16 |
| | | Variance | 0 | 81 | 0 | 9 | 0 | 0 | | | | | | 90 |
| **Amalga Harbor** | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | | | 9 | 14 | 31 | 14 | 128 | 259 | 56 | 115 | 0 | 626 |
| | | Variance | | | 72 | 201 | 936 | 189 | 5,966 | 5,703 | 98 | 5,433 | 0 | 18,598 |
| Large coho salmon (>16") | Catch | Estimate | | | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 5 | 0 | 9 |
| | | Variance | | | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 36 | 0 | 50 |
| | Harvest | Estimate | | | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 5 | 0 | 9 |
| | | Variance | | | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 36 | 0 | 50 |
| Small coho salmon (<16") | Catch | Estimate | | | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 1 | 0 | 17 |
| | | Variance | | | 0 | 0 | 0 | 0 | 0 | 78 | 0 | 1 | 0 | 79 |
| | Harvest | Estimate | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Variance | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pink salmon | Catch | Estimate | | | 0 | 0 | 0 | 9 | 52 | 416 | 19 | 0 | 0 | 496 |
| | | Variance | | | 0 | 0 | 0 | 84 | 1,418 | 106,337 | 310 | 0 | 0 | 108,149 |
| | Harvest | Estimate | | | 0 | 0 | 0 | 9 | 30 | 182 | 0 | 0 | 0 | 221 |
| | | Variance | | | 0 | 0 | 0 | 84 | 479 | 24,134 | 0 | 0 | 0 | 24,697 |
| Chum salmon | Catch | Estimate | | | 0 | 0 | 0 | 0 | 2 | 45 | 5 | 0 | 0 | 52 |
| | | Variance | | | 0 | 0 | 0 | 0 | 2 | 1,072 | 22 | 0 | 0 | 1,096 |
| | Harvest | Estimate | | | 0 | 0 | 0 | 0 | 2 | 7 | 0 | 0 | 0 | 9 |
| | | Variance | | | 0 | 0 | 0 | 0 | 2 | 56 | 0 | 0 | 0 | 58 |
| Dolly Varden | Catch | Estimate | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 7 |
| | | Variance | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 0 | 29 |
| | Harvest | Estimate | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Variance | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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Appendix A4. (Page 3 of 3).

| | | | Biweekly Period | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 5/07-5/20 | 5/21-6/03 | 6/04-6/17 | 6/18-7/01 | 7/02-7/15 | 7/16-7/29 | 7/30-8/12 | 8/13-8/26 | 8/27-9/09 | 9/10-9/23 | 9/24-10/07 | Total |
| Shrine Island | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | 296 | 333 | 255 | 357 | 377 | 418 | 373 | 345 | 144 | 20 | | 2,918 |
| | | Variance | 8,704 | 14,603 | 10,211 | 13,198 | 10,388 | 11,790 | 14,677 | 10,728 | 4,279 | 211 | | 98,789 |
| Large coho salmon (>16") | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 18 | 0 | | 31 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 86 | 115 | 0 | | 201 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 18 | 0 | | 30 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 82 | 115 | 0 | | 197 |
| Pink salmon | Catch | Estimate | 0 | 0 | 0 | 0 | 35 | 106 | 154 | 17 | 7 | 0 | | 319 |
| | | Variance | 0 | 0 | 0 | 0 | 609 | 5,537 | 11,996 | 103 | 18 | 0 | | 18,263 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 13 | 106 | 19 | 16 | 7 | 0 | | 161 |
| | | Variance | 0 | 0 | 0 | 0 | 408 | 5,537 | 205 | 102 | 18 | 0 | | 6,270 |
| Dolly Varden | Catch | Estimate | 6 | 0 | 18 | 21 | 20 | 3 | 18 | 0 | 0 | 0 | | 86 |
| | | Variance | 19 | 0 | 167 | 75 | 234 | 3 | 245 | 0 | 0 | 0 | | 743 |
| | Harvest | Estimate | 6 | 0 | 14 | 14 | 9 | 3 | 0 | 0 | 0 | 0 | | 46 |
| | | Variance | 19 | 0 | 69 | 57 | 181 | 3 | 0 | 0 | 0 | 0 | | 329 |

Appendix A5. Effort and harvest statistics for the saltwater beaches located in the central portion (Auke Bay and Fritz Cove area) of the Juneau roadside by biweekly period and area during 1990.

| | | | Biweekly Period | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 5/07-5/20 | 5/21-6/03 | 6/04-6/17 | 6/18-7/01 | 7/02-7/15 | 7/16-7/29 | 7/30-8/12 | 8/13-8/26 | 8/27-9/09 | 9/10-9/23 | 9/24-10/07 | Total |
| Point Louisa | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | 272 | 380 | 187 | 615 | 682 | 682 | 533 | 495 | 350 | 74 | | 4,270 |
| | | Variance | 9,448 | 10,645 | 4,624 | 25,681 | 47,968 | 13,083 | 20,942 | 15,813 | 13,879 | 931 | | 163,014 |
| Large chinook salmon (>28") | Catch | Estimate | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 1 |
| | | Variance | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 1 |
| | Harvest | Estimate | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 1 |
| | | Variance | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 1 |
| Small chinook salmon (<28") | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 | 0 | 0 | | 51 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,463 | 0 | 0 | | 1,463 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| Large coho salmon (>16") | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 33 | 0 | | 49 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 242 | 528 | 0 | | 770 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 33 | 0 | | 49 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 242 | 528 | 0 | | 770 |
| Small coho salmon (<16") | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | | 6 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 117 | 0 | | 117 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| Pink salmon | Catch | Estimate | 0 | 0 | 0 | 46 | 264 | 258 | 255 | 209 | 69 | 0 | | 1,101 |
| | | Variance | 0 | 0 | 0 | 622 | 13,194 | 6,770 | 19,180 | 7,879 | 4,642 | 0 | | 52,287 |
| | Harvest | Estimate | 0 | 0 | 0 | 46 | 258 | 195 | 239 | 166 | 26 | 0 | | 930 |
| | | Variance | 0 | 0 | 0 | 622 | 13,029 | 2,852 | 18,486 | 6,128 | 425 | 0 | | 41,542 |
| Dolly Varden | Catch | Estimate | 6 | 0 | 37 | 80 | 13 | 0 | 0 | 10 | 0 | 0 | | 146 |
| | | Variance | 57 | 0 | 672 | 1,606 | 150 | 0 | 0 | 154 | 0 | 0 | | 2,639 |
| | Harvest | Estimate | 6 | 0 | 3 | 80 | 13 | 0 | 0 | 0 | 0 | 0 | | 102 |
| | | Variance | 57 | 0 | 48 | 1,606 | 150 | 0 | 0 | 0 | 0 | 0 | | 1,861 |
| Cutthroat Trout | Catch | Estimate | 0 | 9 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | | 14 |
| | | Variance | 0 | 109 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | | 128 |
| | Harvest | Estimate | 0 | 9 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | | 14 |
| | | Variance | 0 | 109 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | | 128 |
| Ferry Terminal | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | 80 | 33 | 0 | | | | | | | | | 113 |
| | | Variance | 8,200 | 1,089 | 0 | | | | | | | | | 9,289 |
| Dolly Varden | Catch | Estimate | 119 | 0 | 0 | | | | | | | | | 119 |
| | | Variance | 18,117 | 0 | 0 | | | | | | | | | 18,117 |
| | Harvest | Estimate | 111 | 0 | 0 | | | | | | | | | 111 |
| | | Variance | 15,878 | 0 | 0 | | | | | | | | | 15,878 |

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| | | | Biweekly Period | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 5/07-5/20 | 5/21-6/03 | 6/04-6/17 | 6/18-7/01 | 7/02-7/15 | 7/16-7/29 | 7/30-8/12 | 8/13-8/26 | 8/27-9/09 | 9/10-9/23 | 9/24-10/07 | Total |
| Auke Bay Floats | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | | 33 | 453 | 657 | 437 | 319 | 416 | 244 | 42 | | | 2,601 |
| | | Variance | | 545 | 28,788 | 54,701 | 27,588 | 6,058 | 60,928 | 22,716 | 588 | | | 201,912 |
| Large chinook salmon (>28") | Catch | Estimate | | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 11 | | | 15 |
| | | Variance | | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 85 | | | 97 |
| | Harvest | Estimate | | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 11 | | | 15 |
| | | Variance | | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 85 | | | 97 |
| Small chinook salmon (<28") | Catch | Estimate | | 0 | 0 | 0 | 49 | 4 | 0 | 0 | 0 | | | 53 |
| | | Variance | | 0 | 0 | 0 | 1,826 | 31 | 0 | 0 | 0 | | | 1,857 |
| | Harvest | Estimate | | 0 | 0 | 0 | 22 | 4 | 0 | 0 | 0 | | | 26 |
| | | Variance | | 0 | 0 | 0 | 361 | 31 | 0 | 0 | 0 | | | 392 |
| Pink salmon | Catch | Estimate | | 0 | 0 | 0 | 0 | 94 | 0 | 12 | 0 | | | 106 |
| | | Variance | | 0 | 0 | 0 | 0 | 3,524 | 0 | 133 | 0 | | | 3,657 |
| | Harvest | Estimate | | 0 | 0 | 0 | 0 | 94 | 0 | 8 | 0 | | | 102 |
| | | Variance | | 0 | 0 | 0 | 0 | 3,524 | 0 | 62 | 0 | | | 3,586 |
| Dolly Varden | Catch | Estimate | | 0 | 41 | 149 | 0 | 0 | 45 | 0 | 0 | | | 235 |
| | | Variance | | 0 | 631 | 8,005 | 0 | 0 | 1,803 | 0 | 0 | | | 10,439 |
| | Harvest | Estimate | | 0 | 15 | 48 | 0 | 0 | 45 | 0 | 0 | | | 108 |
| | | Variance | | 0 | 172 | 922 | 0 | 0 | 1,803 | 0 | 0 | | | 2,897 |

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| | | | Biweekly Period | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 5/07-5/20 | 5/21-6/03 | 6/04-6/17 | 6/18-7/01 | 7/02-7/15 | 7/16-7/29 | 7/30-8/12 | 8/13-8/26 | 8/27-9/09 | 9/10-9/23 | 9/24-10/07 | Total |
| Auke Creek Mouth | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | | | | 74 | 235 | 393 | 368 | 806 | 487 | 0 | 0 | 2,363 |
| | | Variance | | | | 2,296 | 8,759 | 8,924 | 35,783 | 17,504 | 109,181 | 0 | 0 | 182,447 |
| Large chinook salmon (>28") | Catch | Estimate | | | | 0 | 0 | 3 | 12 | 96 | 18 | 0 | 0 | 129 |
| | | Variance | | | | 0 | 0 | 14 | 90 | 1,414 | 79 | 0 | 0 | 1,597 |
| | Harvest | Estimate | | | | 0 | 0 | 3 | 12 | 77 | 2 | 0 | 0 | 94 |
| | | Variance | | | | 0 | 0 | 14 | 90 | 1,320 | 2 | 0 | 0 | 1,426 |
| Small chinook salmon (<28") | Catch | Estimate | | | | 5 | 0 | 5 | 8 | 14 | 4 | 0 | 0 | 36 |
| | | Variance | | | | 20 | 0 | 32 | 66 | 179 | 7 | 0 | 0 | 304 |
| | Harvest | Estimate | | | | 5 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 10 |
| | | Variance | | | | 20 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 52 |
| Large coho salmon (>16") | Catch | Estimate | | | | 0 | 0 | 0 | 0 | 10 | 2 | 0 | 0 | 12 |
| | | Variance | | | | 0 | 0 | 0 | 0 | 96 | 2 | 0 | 0 | 98 |
| | Harvest | Estimate | | | | 0 | 0 | 0 | 0 | 10 | 2 | 0 | 0 | 12 |
| | | Variance | | | | 0 | 0 | 0 | 0 | 96 | 2 | 0 | 0 | 98 |
| Small coho salmon (<16") | Catch | Estimate | | | | 0 | 0 | 0 | 0 | 3 | 7 | 0 | 0 | 10 |
| | | Variance | | | | 0 | 0 | 0 | 0 | 13 | 30 | 0 | 0 | 43 |
| | Harvest | Estimate | | | | 0 | 0 | 0 | 0 | 3 | 4 | 0 | 0 | 7 |
| | | Variance | | | | 0 | 0 | 0 | 0 | 13 | 21 | 0 | 0 | 34 |
| Pink salmon | Catch | Estimate | | | | 3 | 21 | 169 | 105 | 1,360 | 859 | 0 | 0 | 2,517 |
| | | Variance | | | | 8 | 292 | 10,343 | 5,581 | 329,953 | 325,035 | 0 | 0 | 671,212 |
| | Harvest | Estimate | | | | 3 | 21 | 64 | 37 | 486 | 17 | 0 | 0 | 628 |
| | | Variance | | | | 8 | 292 | 2,338 | 868 | 237,440 | 114 | 0 | 0 | 241,060 |
| Chum salmon | Catch | Estimate | | | | 8 | 4 | 22 | 0 | 21 | 120 | 0 | 0 | 175 |
| | | Variance | | | | 48 | 11 | 207 | 0 | 203 | 42,932 | 0 | 0 | 43,401 |
| | Harvest | Estimate | | | | 8 | 4 | 6 | 0 | 9 | 0 | 0 | 0 | 27 |
| | | Variance | | | | 48 | 11 | 59 | 0 | 28 | 0 | 0 | 0 | 146 |
| Dolly Varden | Catch | Estimate | | | | 5 | 6 | 0 | 0 | 70 | 0 | 0 | 0 | 81 |
| | | Variance | | | | 20 | 25 | 0 | 0 | 1,748 | 0 | 0 | 0 | 1,793 |
| | Harvest | Estimate | | | | 0 | 6 | 0 | 0 | 2 | 0 | 0 | 0 | 8 |
| | | Variance | | | | 0 | 25 | 0 | 0 | 5 | 0 | 0 | 0 | 30 |
| Cutthroat Trout | Catch | Estimate | | | | 2 | 0 | 0 | 8 | 10 | 0 | 0 | 0 | 20 |
| | | Variance | | | | 2 | 0 | 0 | 62 | 34 | 0 | 0 | 0 | 98 |
| | Harvest | Estimate | | | | 2 | 0 | 0 | 8 | 10 | 0 | 0 | 0 | 20 |
| | | Variance | | | | 2 | 0 | 0 | 62 | 34 | 0 | 0 | 0 | 98 |
| Smugglers Cove | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | 192 | 54 | 77 | | | | | | | | | 323 |
| | | Variance | 6,944 | 1,222 | 1,662 | | | | | | | | | 9,828 |
| Dolly Varden | Catch | Estimate | 106 | 4 | 18 | | | | | | | | | 128 |
| | | Variance | 9,154 | 14 | 129 | | | | | | | | | 9,297 |
| | Harvest | Estimate | 3 | 4 | 7 | | | | | | | | | 14 |
| | | Variance | 56 | 14 | 53 | | | | | | | | | 123 |

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| | | | Biweekly Period | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 5/07-5/20 | 5/21-6/03 | 6/04-6/17 | 6/18-7/01 | 7/02-7/15 | 7/16-7/29 | 7/30-8/12 | 8/13-8/26 | 8/27-9/09 | 9/10-9/23 | 9/24-10/07 | Total |
| **Bay View subdivision** | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | 0 | 45 | 0 | | | | | | | | | 45 |
| | | Variance | 0 | 1,005 | 0 | | | | | | | | | 1,005 |
| Dolly Varden | Catch | Estimate | 0 | 36 | 0 | | | | | | | | | 36 |
| | | Variance | 0 | 732 | 0 | | | | | | | | | 732 |
| | Harvest | Estimate | 0 | 0 | 0 | | | | | | | | | 0 |
| | | Variance | 0 | 0 | 0 | | | | | | | | | 0 |
| **Fish Creek mouth** | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | 24 | 0 | 28 | 17 | 15 | 94 | | | | | | 178 |
| | | Variance | 576 | 0 | 803 | 289 | 234 | 4,727 | | | | | | 6,629 |
| Chum salmon | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 34 | | | | | | 34 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 576 | | | | | | 576 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | 0 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | 0 |
| Dolly Varden | Catch | Estimate | 63 | 0 | 0 | 34 | 0 | 0 | | | | | | 97 |
| | | Variance | 3,960 | 0 | 0 | 1,156 | 0 | 0 | | | | | | 5,116 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | 0 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | 0 |
| **North Douglas Boat Ramp** | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | 104 | 86 | 111 | 40 | 71 | 113 | 21 | 85 | 0 | | | 631 |
| | | Variance | 2,880 | 1,753 | 1,951 | 562 | 1,631 | 2,889 | 114 | 1,562 | 0 | | | 13,342 |
| Dolly Varden | Catch | Estimate | 15 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | | | 20 |
| | | Variance | 442 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | | | 454 |
| | Harvest | Estimate | 15 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | | | 20 |
| | | Variance | 442 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | | | 454 |
| Steelhead Trout | Catch | Estimate | 0 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | | | 45 |
| | | Variance | 0 | 0 | 851 | 0 | 0 | 0 | 0 | 0 | 0 | | | 851 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 |

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| | | | Biweekly Period | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 5/07-5/20 | 5/21-6/03 | 6/04-6/17 | 6/18-7/01 | 7/02-7/15 | 7/16-7/29 | 7/30-8/12 | 8/13-8/26 | 8/27-9/09 | 9/10-9/23 | 9/24-10/07 | Total |
| Picnic Cove | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | 1,920 | 645 | 323 | 550 | 316 | 179 | 64 | 198 | 228 | 50 | | 4,473 |
| | | Variance | 114,080 | 21,946 | 9,633 | 13,133 | 18,920 | 1,898 | 2,382 | 5,816 | 5,744 | 583 | | 194,135 |
| Large chinook salmon (>28") | Catch | Estimate | 46 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | | 50 |
| | | Variance | 510 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | | 529 |
| | Harvest | Estimate | 46 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | | 50 |
| | | Variance | 510 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | | 529 |
| Small chinook salmon (<28") | Catch | Estimate | 0 | 4 | 28 | 3 | 0 | 0 | 0 | 6 | 0 | 0 | | 41 |
| | | Variance | 0 | 5 | 475 | 137 | 0 | 0 | 0 | 9 | 0 | 0 | | 626 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| Large coho salmon (>16") | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 13 | 0 | | 39 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 364 | 111 | 0 | | 475 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 13 | 0 | | 39 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 364 | 111 | 0 | | 475 |
| Small coho salmon (<16") | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | | 3 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | | 11 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | | 3 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | | 11 |
| Pink salmon | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 23 | 13 | 2 | 79 | 0 | | 117 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 333 | 308 | 27 | 3,986 | 0 | | 4,654 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 23 | 13 | 2 | 79 | 0 | | 117 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 333 | 308 | 27 | 3,986 | 0 | | 4,654 |
| Chum salmon | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 | 0 | | 8 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 62 | 0 | 0 | 8 | 0 | | 70 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 | 0 | | 8 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 62 | 0 | 0 | 8 | 0 | | 70 |
| Dolly Varden | Catch | Estimate | 204 | 7 | 0 | 55 | 0 | 0 | 0 | 0 | 0 | 6 | | 272 |
| | | Variance | 7,552 | 29 | 0 | 1,482 | 0 | 0 | 0 | 0 | 0 | 15 | | 9,078 |
| | Harvest | Estimate | 126 | 7 | 0 | 55 | 0 | 0 | 0 | 0 | 0 | 0 | | 188 |
| | | Variance | 3,951 | 29 | 0 | 1,482 | 0 | 0 | 0 | 0 | 0 | 0 | | 5,462 |
| Pacific Halibut | Catch | Estimate | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 23 |
| | | Variance | 448 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 448 |
| | Harvest | Estimate | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 23 |
| | | Variance | 448 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 448 |

Appendix A6. Effort and harvest statistics for the saltwater beaches located on the south end (Gastineau Channel area) of the Juneau roadside by biweekly period and area during 1990.

| | | | Biweekly Period | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 5/07-5/20 | 5/21-6/03 | 6/04-6/17 | 6/18-7/01 | 7/02-7/15 | 7/16-7/29 | 7/30-8/12 | 8/13-8/26 | 8/27-9/09 | 9/10-9/23 | 9/24-10/07 | 10/08-10/21 | 10/22-11/04 | Total |
| **Salmon Creek Mouth** | | | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | | | | 0 | 17 | 998 | 1,072 | 454 | 123 | | | | | 2,664 |
| | | Variance | | | | 0 | 452 | 75,791 | 87,132 | 23,564 | 6,807 | | | | | 193,746 |
| Pink salmon | Catch | Estimate | | | | 0 | 0 | 962 | 3,085 | 3,735 | 636 | | | | | 8,418 |
| | | Variance | | | | 0 | 0 | 143,284 | 1,591,555 | 3,164,789 | 138,314 | | | | | 5,037,942 |
| | Harvest | Estimate | | | | 0 | 0 | 854 | 1,324 | 369 | 72 | | | | | 2,619 |
| | | Variance | | | | 0 | 0 | 129,928 | 207,053 | 29,247 | 3,910 | | | | | 370,138 |
| Chum salmon | Catch | Estimate | | | | 0 | 0 | 124 | 30 | 51 | 0 | | | | | 205 |
| | | Variance | | | | 0 | 0 | 4,917 | 579 | 1,573 | 0 | | | | | 7,069 |
| | Harvest | Estimate | | | | 0 | 0 | 124 | 30 | 0 | 0 | | | | | 154 |
| | | Variance | | | | 0 | 0 | 4,917 | 579 | 0 | 0 | | | | | 5,496 |
| Dolly Varden | Catch | Estimate | | | | 0 | 0 | 212 | 35 | 35 | 0 | | | | | 282 |
| | | Variance | | | | 0 | 0 | 12,363 | 693 | 596 | 0 | | | | | 13,652 |
| | Harvest | Estimate | | | | 0 | 0 | 173 | 35 | 35 | 0 | | | | | 243 |
| | | Variance | | | | 0 | 0 | 11,784 | 693 | 596 | 0 | | | | | 13,073 |
| **Gastineau Hatchery** | | | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | 120 | 38 | 0 | 37 | 90 | 1,144 | 1,216 | 624 | 280 | 1,008 | 545 | 105 | 0 | 5,207 |
| | | Variance | 2,496 | 950 | 0 | 875 | 1,501 | 89,048 | 71,794 | 23,811 | 9,308 | 20,941 | 4,030 | 2,701 | 0 | 227,455 |
| Large coho salmon (>16") | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 22 | 22 | 13 | 12 | 0 | 73 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 471 | 284 | 286 | 183 | 0 | 1,245 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 22 | 13 | 12 | 0 | 69 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 471 | 284 | 286 | 183 | 0 | 1,224 |
| Small coho salmon (<16") | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 165 | 4,598 | 1,558 | 90 | 0 | 6,411 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13,668 | 2,588,351 | 196,057 | 14,902 | 0 | 2,812,978 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100 | 3,780 | 1,556 | 90 | 0 | 5,526 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7,094 | 2,085,289 | 196,238 | 14,902 | 0 | 2,303,523 |
| Pink salmon | Catch | Estimate | 0 | 0 | 0 | 0 | 36 | 1,192 | 2,740 | 2,007 | 195 | 0 | 0 | 0 | 0 | 6,170 |
| | | Variance | 0 | 0 | 0 | 0 | 490 | 212,820 | 942,916 | 567,127 | 14,937 | 0 | 0 | 0 | 0 | 1,738,290 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 36 | 1,140 | 1,692 | 1,292 | 65 | 0 | 0 | 0 | 0 | 4,225 |
| | | Variance | 0 | 0 | 0 | 0 | 490 | 214,243 | 442,990 | 263,891 | 2,715 | 0 | 0 | 0 | 0 | 924,329 |
| Chum salmon | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 115 | 40 | 43 | 0 | 0 | 0 | 0 | 0 | 198 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 2,218 | 629 | 694 | 0 | 0 | 0 | 0 | 0 | 3,541 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 110 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 118 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 2,018 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 2,046 |
| Dolly Varden | Catch | Estimate | 30 | 0 | 0 | 0 | 0 | 8 | 28 | 0 | 8 | 0 | 30 | 0 | 0 | 104 |
| | | Variance | 2,388 | 0 | 0 | 0 | 0 | 98 | 272 | 0 | 92 | 0 | 693 | 0 | 0 | 3,543 |
| | Harvest | Estimate | 30 | 0 | 0 | 0 | 0 | 3 | 28 | 0 | 0 | 0 | 30 | 0 | 0 | 91 |
| | | Variance | 2,388 | 0 | 0 | 0 | 0 | 32 | 272 | 0 | 0 | 0 | 693 | 0 | 0 | 3,385 |
| Cutthroat Trout | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 6 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 6 |

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| | | | Biweekly Period | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 5/07-5/20 | 5/21-6/03 | 6/04-6/17 | 6/18-7/01 | 7/02-7/15 | 7/16-7/29 | 7/30-8/12 | 8/13-8/26 | 8/27-9/09 | 9/10-9/23 | 9/24-10/07 | 10/08-10/21 | 10/22-11/04 | Total |
| **Sheep Creek mouth** | | | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | 96 | 41 | 82 | 349 | 2,125 | 2,723 | 720 | 142 | 105 | 32 | 16 | 63 | 10 | 6,504 |
| | | Variance | 3,888 | 340 | 2,272 | 15,630 | 155,041 | 375,493 | 70,763 | 3,785 | 1,103 | 746 | 219 | 1,034 | 181 | 630,495 |
| Large coho salmon (>16") | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 19 | 24 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 95 | 542 | 637 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 19 | 22 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 542 | 566 |
| Small coho salmon (<16") | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 |
| Pink salmon | Catch | Estimate | 0 | 0 | 0 | 5 | 24 | 0 | 0 | 120 | 75 | 0 | 0 | 0 | 0 | 224 |
| | | Variance | 0 | 0 | 0 | 124 | 706 | 0 | 0 | 5,652 | 12,002 | 0 | 0 | 0 | 0 | 18,484 |
| | Harvest | Estimate | 0 | 0 | 0 | 5 | 24 | 0 | 0 | 7 | 21 | 0 | 0 | 0 | 0 | 57 |
| | | Variance | 0 | 0 | 0 | 124 | 706 | 0 | 0 | 110 | 1,859 | 0 | 0 | 0 | 0 | 2,799 |
| Chum salmon | Catch | Estimate | 0 | 0 | 0 | 0 | 803 | 4,481 | 1,950 | 265 | 11 | 0 | 0 | 0 | 0 | 7,510 |
| | | Variance | 0 | 0 | 0 | 0 | 64,832 | 2,551,330 | 800,689 | 18,779 | 520 | 0 | 0 | 0 | 0 | 3,436,150 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 603 | 2,184 | 303 | 116 | 5 | 0 | 0 | 0 | 0 | 3,211 |
| | | Variance | 0 | 0 | 0 | 0 | 31,865 | 456,667 | 49,885 | 7,047 | 97 | 0 | 0 | 0 | 0 | 545,561 |
| Dolly Varden | Catch | Estimate | 0 | 41 | 24 | 44 | 117 | 228 | 53 | 12 | 35 | 0 | 0 | 5 | 0 | 559 |
| | | Variance | 0 | 1,218 | 531 | 3,821 | 1,603 | 10,944 | 1,423 | 78 | 1,883 | 0 | 0 | 93 | 0 | 21,594 |
| | Harvest | Estimate | 0 | 21 | 24 | 4 | 76 | 163 | 47 | 4 | 14 | 0 | 0 | 0 | 0 | 353 |
| | | Variance | 0 | 304 | 531 | 55 | 1,207 | 9,547 | 1,102 | 8 | 266 | 0 | 0 | 0 | 0 | 13,020 |
| **Juneau-Douglas Bridge** | | | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | 427 | 198 | 108 | 111 | 179 | 28 | 16 | 0 | 0 | | | | | 1,067 |
| | | Variance | 23,268 | 2,886 | 1,333 | 3,540 | 9,711 | 756 | 484 | 0 | 0 | | | | | 41,978 |
| Pink salmon | Catch | Estimate | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | | | | | 9 |
| | | Variance | 0 | 0 | 0 | 0 | 70 | 0 | 0 | 0 | 0 | | | | | 70 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | | | | | 9 |
| | | Variance | 0 | 0 | 0 | 0 | 70 | 0 | 0 | 0 | 0 | | | | | 70 |
| Chum salmon | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 0 | 0 | | | | | 14 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 189 | 0 | 0 | 0 | | | | | 189 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 0 | 0 | | | | | 14 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 189 | 0 | 0 | 0 | | | | | 189 |
| Dolly Varden | Catch | Estimate | 567 | 49 | 9 | 0 | 91 | 0 | 0 | 0 | 0 | | | | | 716 |
| | | Variance | 48,083 | 1,088 | 44 | 0 | 6,466 | 0 | 0 | 0 | 0 | | | | | 55,681 |
| | Harvest | Estimate | 291 | 49 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 349 |
| | | Variance | 29,972 | 1,088 | 44 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 31,104 |
| **Kowee Creek Mouth** | | | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | 32 | 139 | 57 | 71 | 0 | 28 | 0 | 0 | 0 | | | | | 327 |
| | | Variance | 512 | 3,910 | 706 | 3,283 | 0 | 756 | 0 | 0 | 0 | | | | | 9,167 |
| Dolly Varden | Catch | Estimate | 16 | 30 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 70 |
| | | Variance | 200 | 402 | 242 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 844 |
| | Harvest | Estimate | 0 | 30 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 54 |
| | | Variance | 0 | 402 | 242 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 644 |

Appendix A7. Effort and harvest statistics for surveyed freshwater systems located on the Juneau roadside by biweekly period and area during 1990.

| | | | Biweekly Period | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 5/07-5/20 | 5/21-6/03 | 6/04-6/17 | 6/18-7/01 | 7/02-7/15 | 7/16-7/29 | 7/30-8/12 | 8/13-8/26 | 8/27-9/09 | 9/10-9/23 | 9/24-10/07 | 10/08-10/21 | 10/22-11/04 | Total |
| Cowee Creek | | | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | 8 | 41 | 28 | 176 | 267 | 492 | 277 | 295 | 473 | 731 | 154 | 98 | | 3,040 |
| | | Variance | 64 | 885 | 369 | 4,849 | 12,130 | 25,917 | 25,031 | 16,938 | 10,130 | 20,051 | 2,826 | 2,903 | | 122,093 |
| Large coho salmon (>16") | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 179 | 452 | 152 | 3 | | 801 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 413 | 6,127 | 26,979 | 9,545 | 4 | | 43,068 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 135 | 340 | 152 | 3 | | 645 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 413 | 2,061 | 15,797 | 9,545 | 4 | | 27,820 |
| Small coho salmon (<16") | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 23 | 13 | 11 | 2 | | 55 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 83 | 1,144 | 377 | 35 | 0 | | 1,639 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 11 | 2 | | 16 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 77 | 35 | 0 | | 112 |
| Pink salmon | Catch | Estimate | 0 | 0 | 0 | 0 | 85 | 1,091 | 356 | 165 | 31 | 4 | 0 | 0 | | 1,732 |
| | | Variance | 0 | 0 | 0 | 0 | 2,768 | 278,106 | 47,458 | 7,233 | 291 | 9 | 0 | 0 | | 335,865 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 33 | 589 | 319 | 61 | 18 | 4 | 0 | 0 | | 1,024 |
| | | Variance | 0 | 0 | 0 | 0 | 690 | 91,049 | 44,736 | 1,132 | 93 | 9 | 0 | 0 | | 137,709 |
| Chum salmon | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 5 | 23 | 6 | 4 | 0 | 0 | 0 | | 38 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 20 | 266 | 83 | 28 | 0 | 0 | 0 | | 397 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | | 5 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | | 17 |
| Dolly Varden | Catch | Estimate | 0 | 0 | 0 | 132 | 226 | 88 | 0 | 5 | 40 | 45 | 5 | 0 | | 541 |
| | | Variance | 0 | 0 | 0 | 5,559 | 12,993 | 2,746 | 0 | 70 | 635 | 414 | 57 | 0 | | 22,474 |
| | Harvest | Estimate | 0 | 0 | 0 | 108 | 153 | 53 | 0 | 5 | 18 | 32 | 5 | 0 | | 374 |
| | | Variance | 0 | 0 | 0 | 4,287 | 5,078 | 792 | 0 | 70 | 343 | 398 | 57 | 0 | | 11,025 |
| Cutthroat Trout | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | | 6 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 72 | 0 | 0 | 0 | | 72 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |

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| | | | Biweekly Period | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 5/07-5/20 | 5/21-6/03 | 6/04-6/17 | 6/18-7/01 | 7/02-7/15 | 7/16-7/29 | 7/30-8/12 | 8/13-8/26 | 8/27-9/09 | 9/10-9/23 | 9/24-10/07 | 10/08-10/21 | 10/22-11/04 | Total |
| Peterson Creek | | | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | | | | 74 | 92 | 58 | 171 | 68 | 60 | 298 | 287 | 116 | | 1,224 |
| | | Variance | | | | 1,766 | 3,745 | 1,369 | 11,719 | 1,891 | 839 | 9,750 | 3,155 | 5,237 | | 39,471 |
| Large coho salmon (>16") | Catch | Estimate | | | | 0 | 0 | 0 | 0 | 0 | 4 | 75 | 175 | 0 | | 254 |
| | | Variance | | | | 0 | 0 | 0 | 0 | 0 | 144 | 1,462 | 17,528 | 0 | | 19,134 |
| | Harvest | Estimate | | | | 0 | 0 | 0 | 0 | 0 | 2 | 43 | 66 | 0 | | 111 |
| | | Variance | | | | 0 | 0 | 0 | 0 | 0 | 36 | 860 | 19,295 | 0 | | 20,191 |
| Small coho salmon (<16") | Catch | Estimate | | | | 0 | 0 | 0 | 0 | 0 | 53 | 15 | 0 | 9 | | 77 |
| | | Variance | | | | 0 | 0 | 0 | 0 | 0 | 889 | 76 | 0 | 50 | | 1,015 |
| | Harvest | Estimate | | | | 0 | 0 | 0 | 0 | 0 | 53 | 15 | 0 | 9 | | 77 |
| | | Variance | | | | 0 | 0 | 0 | 0 | 0 | 889 | 76 | 0 | 50 | | 1,015 |
| Pink salmon | Catch | Estimate | | | | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | | 21 |
| | | Variance | | | | 0 | 0 | 0 | 868 | 0 | 0 | 0 | 0 | 0 | | 868 |
| | Harvest | Estimate | | | | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | | 21 |
| | | Variance | | | | 0 | 0 | 0 | 868 | 0 | 0 | 0 | 0 | 0 | | 868 |
| Dolly Varden | Catch | Estimate | | | | 0 | 0 | 76 | 0 | 0 | 0 | 18 | 22 | 53 | | 169 |
| | | Variance | | | | 0 | 0 | 2,839 | 0 | 0 | 0 | 103 | 193 | 1,559 | | 4,694 |
| | Harvest | Estimate | | | | 0 | 0 | 66 | 0 | 0 | 0 | 14 | 22 | 34 | | 136 |
| | | Variance | | | | 0 | 0 | 2,626 | 0 | 0 | 0 | 72 | 193 | 647 | | 3,538 |
| Cutthroat Trout | Catch | Estimate | | | | 0 | 0 | 14 | 32 | 0 | 64 | 52 | 1 | 26 | | 189 |
| | | Variance | | | | 0 | 0 | 171 | 518 | 0 | 1,448 | 740 | 5 | 392 | | 3,274 |
| | Harvest | Estimate | | | | 0 | 0 | 14 | 32 | 0 | 61 | 48 | 1 | 26 | | 182 |
| | | Variance | | | | 0 | 0 | 171 | 518 | 0 | 1,324 | 797 | 5 | 392 | | 3,207 |
| Montana Creek (Upper) | | | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | | | | | | | 288 | 49 | 42 | 13 | 8 | 5 | | 405 |
| | | Variance | | | | | | | 17,294 | 2,085 | 1,764 | 169 | 113 | 28 | | 21,453 |
| Dolly Varden | Catch | Estimate | | | | | | | 21 | 17 | 28 | 0 | 0 | 0 | | 66 |
| | | Variance | | | | | | | 408 | 277 | 784 | 0 | 0 | 0 | | 1,469 |
| | Harvest | Estimate | | | | | | | 0 | 17 | 28 | 0 | 0 | 0 | | 45 |
| | | Variance | | | | | | | 0 | 277 | 784 | 0 | 0 | 0 | | 1,061 |
| Cutthroat Trout | Catch | Estimate | | | | | | | 21 | 0 | 0 | 0 | 0 | 0 | | 21 |
| | | Variance | | | | | | | 408 | 0 | 0 | 0 | 0 | 0 | | 408 |
| | Harvest | Estimate | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| | | Variance | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| Montana Creek (Middle) | | | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | | | | | | | 0 | 8 | 0 | 0 | 0 | 0 | | 8 |
| | | Variance | | | | | | | 0 | 60 | 0 | 0 | 0 | 0 | | 60 |

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| | | | Biweekly Period | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 5/07-5/20 | 5/21-6/03 | 6/04-6/17 | 6/18-7/01 | 7/02-7/15 | 7/16-7/29 | 7/30-8/12 | 8/13-8/26 | 8/27-9/09 | 9/10-9/23 | 9/24-10/07 | 10/08-10/21 | 10/22-11/04 | Total |
| Montana Creek (Lower) | | | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | 136 | 23 | 65 | 51 | 102 | 69 | 43 | 8 | 182 | 398 | 329 | 21 | | 1,427 |
| | | Variance | 4,808 | 289 | 3,283 | 1,012 | 2,186 | 4,727 | 455 | 60 | 4,623 | 10,553 | 11,477 | 110 | | 43,583 |
| Large coho salmon (>16") | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 244 | 160 | 2 | | 442 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 523 | 13,643 | 8,420 | 1 | | 22,587 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 63 | 114 | 2 | | 215 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 523 | 1,467 | 3,826 | 1 | | 5,817 |
| Small coho salmon (<16") | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 99 | 109 | 3 | | 221 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 65 | 2,901 | 5,572 | 1 | | 8,539 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 97 | 49 | 3 | | 149 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,911 | 1,430 | 1 | | 4,342 |
| Pink salmon | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 16 | 0 | 4 | 0 | 0 | | 50 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 890 | 0 | 240 | 0 | 43 | 0 | 0 | | 1,173 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | | 30 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 890 | 0 | 0 | 0 | 0 | 0 | 0 | | 890 |
| Chum salmon | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | | 16 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 253 | 0 | 0 | 0 | 0 | 0 | 0 | | 253 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| Dolly Varden | Catch | Estimate | 0 | 3 | 0 | 43 | 42 | 0 | 47 | 0 | 117 | 54 | 63 | 0 | | 369 |
| | | Variance | 0 | 8 | 0 | 1,652 | 1,021 | 0 | 851 | 0 | 10,251 | 2,509 | 769 | 0 | | 17,061 |
| | Harvest | Estimate | 0 | 0 | 0 | 43 | 4 | 0 | 5 | 0 | 0 | 4 | 15 | 0 | | 71 |
| | | Variance | 0 | 0 | 0 | 1,652 | 20 | 0 | 10 | 0 | 0 | 20 | 195 | 0 | | 1,897 |
| Cutthroat Trout | Catch | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 4 | 15 | 0 | | 21 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 43 | 101 | 0 | | 146 |
| | Harvest | Estimate | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | | 4 |
| | | Variance | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 4 | 0 | | 6 |
| Mendenhall Ponds | | | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | | | | | | | | | | 59 | 62 | 66 | 71 | 258 |
| | | Variance | | | | | | | | | | 1,479 | 2,804 | 717 | 2,347 | 7,347 |
| Large coho salmon (>16") | Catch | Estimate | | | | | | | | | | 0 | 0 | 13 | 0 | 13 |
| | | Variance | | | | | | | | | | 0 | 0 | 102 | 0 | 102 |
| | Harvest | Estimate | | | | | | | | | | 0 | 0 | 13 | 0 | 13 |
| | | Variance | | | | | | | | | | 0 | 0 | 102 | 0 | 102 |
| Small coho salmon (<16") | Catch | Estimate | | | | | | | | | | 0 | 0 | 192 | 45 | 237 |
| | | Variance | | | | | | | | | | 0 | 0 | 35,555 | 1,180 | 36,735 |
| | Harvest | Estimate | | | | | | | | | | 0 | 0 | 97 | 45 | 142 |
| | | Variance | | | | | | | | | | 0 | 0 | 8,965 | 1,180 | 10,145 |
| Dolly Varden | Catch | Estimate | | | | | | | | | | 3 | 7 | 0 | 0 | 10 |
| | | Variance | | | | | | | | | | 7 | 17 | 0 | 0 | 24 |
| | Harvest | Estimate | | | | | | | | | | 3 | 7 | 0 | 0 | 10 |
| | | Variance | | | | | | | | | | 7 | 17 | 0 | 0 | 24 |

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Appendix A7. (Page 4 of 4).

| | | | Biweekly Period | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 5/07-5/20 | 5/21-6/03 | 6/04-6/17 | 6/18-7/01 | 7/02-7/15 | 7/16-7/29 | 7/30-8/12 | 8/13-8/26 | 8/27-9/09 | 9/10-9/23 | 9/24-10/07 | 10/08-10/21 | 10/22-11/04 | Total |
| Fish Creek | | | | | | | | | | | | | | | | |
| Angler-hours of effort | | Estimate | | | | 184 | 422 | 902 | 1,232 | 793 | 459 | 387 | 401 | 163 | 8 | 4,951 |
| | | Variance | | | | 28,715 | 21,127 | 23,572 | 30,869 | 35,970 | 20,028 | 5,686 | 8,737 | 4,480 | 63 | 179,247 |
| Large chinook salmon (>28") | Catch | Estimate | | | | 0 | 5 | 22 | 27 | 7 | 0 | 0 | 0 | 0 | 0 | 61 |
| | | Variance | | | | 0 | 38 | 294 | 411 | 125 | 0 | 0 | 0 | 0 | 0 | 868 |
| | Harvest | Estimate | | | | 0 | 0 | 22 | 27 | 7 | 0 | 0 | 0 | 0 | 0 | 56 |
| | | Variance | | | | 0 | 0 | 294 | 411 | 125 | 0 | 0 | 0 | 0 | 0 | 830 |
| Small chinook salmon (<28") | Catch | Estimate | | | | 0 | 6 | 6 | 69 | 0 | 0 | 0 | 0 | 0 | 0 | 81 |
| | | Variance | | | | 0 | 49 | 55 | 1,631 | 0 | 0 | 0 | 0 | 0 | 0 | 1,735 |
| | Harvest | Estimate | | | | 0 | 6 | 6 | 69 | 0 | 0 | 0 | 0 | 0 | 0 | 81 |
| | | Variance | | | | 0 | 49 | 55 | 1,631 | 0 | 0 | 0 | 0 | 0 | 0 | 1,735 |
| Large coho salmon (>16") | Catch | Estimate | | | | 0 | 0 | 0 | 0 | 12 | 29 | 26 | 43 | 10 | 0 | 120 |
| | | Variance | | | | 0 | 0 | 0 | 0 | 83 | 358 | 198 | 558 | 216 | 0 | 1,413 |
| | Harvest | Estimate | | | | 0 | 0 | 0 | 0 | 12 | 29 | 26 | 43 | 10 | 0 | 120 |
| | | Variance | | | | 0 | 0 | 0 | 0 | 83 | 358 | 198 | 558 | 216 | 0 | 1,413 |
| Small coho salmon (<16") | Catch | Estimate | | | | 0 | 0 | 0 | 0 | 432 | 248 | 629 | 273 | 29 | 0 | 1,611 |
| | | Variance | | | | 0 | 0 | 0 | 0 | 43,683 | 14,503 | 64,673 | 12,259 | 569 | 0 | 135,687 |
| | Harvest | Estimate | | | | 0 | 0 | 0 | 0 | 341 | 248 | 460 | 207 | 29 | 0 | 1,285 |
| | | Variance | | | | 0 | 0 | 0 | 0 | 31,667 | 14,503 | 59,955 | 8,070 | 569 | 0 | 114,764 |
| Pink salmon | Catch | Estimate | | | | 0 | 0 | 330 | 2,140 | 1,240 | 1,251 | 17 | 0 | 0 | 0 | 4,978 |
| | | Variance | | | | 0 | 0 | 7,924 | 232,233 | 147,959 | 269,328 | 534 | 0 | 0 | 0 | 657,978 |
| | Harvest | Estimate | | | | 0 | 0 | 240 | 523 | 293 | 347 | 0 | 0 | 0 | 0 | 1,403 |
| | | Variance | | | | 0 | 0 | 5,984 | 41,234 | 16,366 | 33,187 | 0 | 0 | 0 | 0 | 96,771 |
| Chum salmon | Catch | Estimate | | | | 0 | 6 | 151 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 174 |
| | | Variance | | | | 0 | 49 | 3,524 | 296 | 0 | 0 | 0 | 0 | 0 | 0 | 3,869 |
| | Harvest | Estimate | | | | 0 | 6 | 33 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 56 |
| | | Variance | | | | 0 | 49 | 876 | 296 | 0 | 0 | 0 | 0 | 0 | 0 | 1,221 |
| Dolly Varden | Catch | Estimate | | | | 0 | 13 | 23 | 0 | 27 | 0 | 17 | 0 | 0 | 0 | 80 |
| | | Variance | | | | 0 | 230 | 432 | 0 | 1,117 | 0 | 534 | 0 | 0 | 0 | 2,313 |
| | Harvest | Estimate | | | | 0 | 13 | 16 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 44 |
| | | Variance | | | | 0 | 230 | 368 | 0 | 685 | 0 | 0 | 0 | 0 | 0 | 1,283 |
| Cutthroat Trout | Catch | Estimate | | | | 0 | 0 | 0 | 0 | 6 | 58 | 0 | 0 | 0 | 0 | 64 |
| | | Variance | | | | 0 | 0 | 0 | 0 | 7 | 1,699 | 0 | 0 | 0 | 0 | 1,706 |
| | Harvest | Estimate | | | | 0 | 0 | 0 | 0 | 6 | 58 | 0 | 0 | 0 | 0 | 64 |
| | | Variance | | | | 0 | 0 | 0 | 0 | 7 | 1,699 | 0 | 0 | 0 | 0 | 1,706 |

Appendix A8. Numbers of chinook salmon sampled for missing adipose fins by area during 1990.

| Area | Chinook Salmon Sampled | |
|---|---|---|
| | Large | Small |
| Northern Saltwater Beaches (Lynn Canal area): | | |
| North Bridget Cove | 1 | 0 |
| Sunrise Beach | 0 | 1 |
| Central Saltwater Beaches (Auke Bay and Fritz Cove area): | | |
| Point Louisa | 1 | 0 |
| Auke Bay Floats | 2 | 6 |
| Auke Creek Mouth | 14 | 4 |
| Picnic Cove | 10 | 0 |
| Freshwater Systems: | | |
| Fish Creek | 4 | 5 |
| Total | 32 | 16 |

Appendix A9. Numbers of coho salmon sampled for missing adipose fins by area during 1990.

| Area | | Coho Salmon Sampled | |
|---|---|---|---|
| | | Large | Jack |
| Northern Saltwater Beaches (Lynn Canal area): | | | |
| Amalga Harbor | | 2 | 0 |
| Shrine Island | | 2 | 0 |
| | Sub-Total | 4 | 0 |
| Central Saltwater Beaches (Auke Bay and Fritz Cove area): | | | |
| Point Louisa | | 9 | 0 |
| Auke Creek Mouth | | 2 | 2 |
| Picnic Cove | | 4 | 1 |
| | Sub-Total | 15 | 3 |
| Southern Saltwater Beaches (Gastineau Channel area): | | | |
| Gastineau Hatchery | | 7 | 518 |
| Sheep Creek mouth | | 3 | 1 |
| | Sub-Total | 10 | 519 |
| Freshwater Systems: | | | |
| Cowee Creek | | 87 | 4 |
| Peterson Creek | | 11 | 13 |
| Montana Creek (lower) | | 62 | 15 |
| Mendenhall Ponds | | 2 | 10 |
| Fish Creek | | 28 | 152 |
| | Sub-Total | 190 | 194 |
| | Grand Total | 219 | 716 |

Appendix A10. Numbers of Dolly Varden sampled for floy tags and caudal fin clips by area during 1990.

| Area | | Number Sampled |
|---|---|---|
| Northern Saltwater Beaches (Lynn Canal area): | | |
| Echo Cove | | 40 |
| North Bridget Cove | | 0 |
| South Bridget Cove | | 0 |
| Sunshine Cove | | 10 |
| Sunrise Beach | | 20 |
| End of Road Bluffs | | 3 |
| Amalga Harbor | | 0 |
| Shrine Island | | 10 |
| | Sub-Total | 83 |
| Central Saltwater Beaches (Auke Bay and Fritz Cove area): | | |
| Point Louisa | | 14 |
| Ferry Terminal | | 12 |
| Auke Bay Floats | | 6 |
| Auke Creek Mouth | | 2 |
| Smugglers Cove | | 4 |
| Bay View Subdivision | | 2 |
| Fish Creek mouth | | 0 |
| North Douglas Boat Ramp | | 3 |
| Picnic Cove | | 17 |
| | Sub-Total | 60 |
| Southern Saltwater Beaches (Gastineau Channel area): | | |
| Salmon Creek mouth | | 25 |
| Gastineau Hatchery | | 9 |
| Sheep Creek mouth | | 48 |
| Juneau-Douglas Bridge | | 27 |
| Kowee Creek mouth | | 5 |
| | Sub-Total | 114 |
| Freshwater Systems: | | |
| Cowee Creek | | 76 |
| Peterson Creek | | 15 |
| Montana Creek (upper) | | 5 |
| Montana Creek (middle) | | 0 |
| Montana Creek (lower) | | 8 |
| Mendenhall Ponds | | 2 |
| Fish Creek | | 7 |
| | Sub-Total | 113 |
| | Grand Total | 370 |